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An Address

ON

URÆMIA AND NEPHRITIS*

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ON reviewing our present understanding of nephritis one is impressed by the tendency to classify deranged renal function into separate episodes as if there were a clean-cut distinction between different stages. This has been the case not only in the ante mortem classification but also in the post mortem description. If, however, we view the question with a broader conception, we are forced to consider nephritis as a progressive lesion in the majority of cases. If this be held then the clinical and pathological findings at any one period of the disease merely represent an episode in the course of its full history. The separation of the periods of pathological development into distinct diseases has led to a number of different classifications being enunciated. These are based upon either ante or post mortem findings. It has frequently been found that in a gross fashion they agree; but, many times the ante mortem diagnosis has not been based so much upon a clear-cut differentiation of the clinical findings in correlation with the pathological picture expected as upon a more or less empirical opinion received from the course and history of the illness.

In order to assess properly the relative value of the findings in the investigation of a case of nephritis, it is well to keep in mind a conception of how the kidney functions, how it responds to different stimuli, and, finally, how it carries on its work under more or less abnormal con-

ditions. This presupposes an understanding of what the different functions of the kidney are. In the first instance it may be granted that the renal excretion plays probably the most important rôle in eliminating the catabolic products of tissue metabolism. Apart from the carbon dioxide removed by the respiratory tract and certain less volatile substances excreted by the liver and the bowel, it may be conceded that the kidney is accountable for the remainder. The renal functions may be briefly outlined as follows:—

- 1.—The regulation of the water equilibrium of the blood. During the vicissitudes of ordinary normal life there is considerable fluctuation in the intake of water by the mouth and loss through other channels than the kidney. It is necessary, therefore, for the body to have some method whereby the water equilibrium may be maintained. It is quite obvious that this is accomplished by the kidney when we consider the great diminution in the renal out-put which occurs during a period of severe sweating in spite of increased water intake, and the pronounced diuresis under opposite conditions.

- 2.—The regulation of the saline contents and equilibrium of the blood. The constancy of the molecular concentration of salts in the blood and tissues, and the proper balance of the different salts in relation to each other, is one of the most constant phenomena in biology. In this regulation the kidney assumes a paramount rôle.

- 3.—Closely allied to these two functions is the

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maintenance of the normal reaction or the acid-base equilibrium of the blood. This is a regulation of prime importance and the kidney takes the leading part in maintaining this balance. It may be said to exercise the coarse adjustment while the respiration, through the elimination of the weak and easily diffusible carbonic acid as CO_2 , affords the fine adjustment. There is probably no function or balance in the body which may be subject to such sudden and violent potential changes as those of the pH or hydrogen ion concentration of the blood. It is all the more remarkable, therefore, to observe the facility and flexibility of its regulation by the kidneys and the lungs.

4.—The elimination of the products of nitrogenous metabolism such as urea, uric acid, creatinine, ammonia, etc. During health these substances are excreted by the kidney with apparent ease. Furthermore, they are maintained at such a remarkably constant level in the arterial blood as to suggest that they may serve some definite rôle in the organic regulation of function as is found to be the case with that other important product of metabolism, e.g., carbon dioxide.

5.—There is evidence which strongly suggests that the kidney may have other eliminative functions which are at present not understood.

The manner in which the kidney accomplishes its different functions is at present not definitely decided. There are two schools of thought on this subject. One which holds that the renal function is accomplished through a process of filtration of a constant fluid from the glomeruli and a selective reabsorption during the passage of the urine down the tubules. The other advocates the thesis that renal function is altogether a secretory act taking place both in the glomeruli and the tubules. It would not be possible within the compass of the present paper to detail the arguments upon which these theories rest. The evidence in favour of the first was up to a few years ago the more convincing, but recently, brilliant and illuminating new work has tended to incline the balance of thought towards the latter view. There is, however, one point in common; namely, that the glomeruli and tubules both play a part in renal function, and injury to either of these anatomical systems may seriously interfere with its proper operation.

It has been found in the normal animal that

a disturbance of any of the conditions of the blood outlined above usually gives rise to a prompt and effective diuresis. As for instance a copious ingestion, intra-venous or subcutaneous injection, of water leads to an increased outpouring of urine by the kidneys as also does an increased saline content of the blood provided that there be sufficient water available. If the latter be deficient the diuresis is fleeting, but the consequent elimination of the salt is accomplished through the vehicle of a concentrated urine. The body under such conditions is divided between the adequate depletion of an excessive saline content in the blood and an excessive water reduction. Under such circumstances it strikes an optimum medium. Like conditions hold where there be an excessive acid or alkali balance in the blood or a sudden accumulation of nitrogenous substances as when an intravenous injection of urea be given without sufficient dilution with water. The urea suddenly accumulates in the blood but is rapidly eliminated by the urine although only a slight diuresis occurs. If, however, a moderate amount of water be injected with the urea, considerable diuresis occurs for a short period. This is greater than what would be produced by the water alone. In short, the normal kidney attempts as far as possible to rectify any abnormal condition but at the same time is apparently prevented from proceeding too far in any one direction; in consequence an optimum balance is maintained between the different abnormal conditions.

The great flexibility of the renal function suggests that the kidney has a reserve of functional capacity. This would be in conformity with other functioning organs such as the heart, lungs, liver, pancreas, etc. But in what manner is this operative in the kidney? As the kidney function is dependent upon a profuse capillary circulation, a consideration of capillary activity elsewhere might throw some light on this problem. Krogh¹, in his masterly investigation of the capillary circulation in the skin and other organs, has shown that the vast capillary bed is not uniformly active under average conditions of functional activity. Richards and Wearn² have demonstrated that this relative activity occurs in the capillary loops of the glomeruli. Therefore, it may be supposed that the functioning elements of the kidney share with other organs the capacity of alternate

rest and work and that it is only under conditions of great urgency that the whole organ is equally active and even then this alternation may be operative during shortened periods.

Although the epithelium of the glomeruli and the tubules are essential elements in renal activity, their function is most intimately dependent upon the quality, quantity, and pressure of the blood flowing through their capillaries. The effect of increased pressure in the ureters and pelvis of the kidney is one around which there has been considerable debate. It has not as yet been definitely determined whether such increase of pressure can be transmitted to the tubules and thus raise the pressure in the lumen of the secretory tubules and the glomeruli. In fact, the balance of evidence at present would indicate that this cannot be the case but that the principal effect is to be found in a disturbance of the circulation in the secretory portions of the kidney. But here we are involved in a physiological controversy based upon short animal experiments. In man such experiments may be observed under a variety of time conditions. If the ureteral obstruction be sudden and complete, comparative arrest of the kidney function promptly occurs. If, on the other hand, the obstruction be intermittent and incomplete as in the impediment of prostatic enlargement, the quantity and quality of the renal excretion is quite characteristic. It increases in quantity and becomes more dilute in quality, so that dehydration of the body in general results. This is in opposition to the view that increased pressure in the ureters leads to a rise of pressure in the tubules and thus to an increased opportunity of absorption. On the other hand, it may be argued that the increased pressure in the tubules leads to an atrophy and degeneration of the tubular epithelium without conspicuously interfering with the glomerular function. Thus the glomerular filtration continues and the tubular epithelium through their damage due to local pressure are unable to accomplish the usual absorption and concentration of the glomerular filtrate which is their normal function. As soon as the peripheral obstruction is removed either by prostatectomy or cystostomy the normal concentration of the renal secretion is resumed provided the damage has not been too complete.

In opposition to the effects of chronic peri-

pheral urinary resistance we have the condition which occurs in disturbances of renal function due to circulatory disturbances. In order to avoid the complicating factors of local vascular changes, we will first consider the more clear-cut examples found in conditions of circulatory failure due to cardiac disease. Here we have a condition dependent upon the blood supply. The old argument as to whether the quantity or the pressure of the blood flow is the more important may be dismissed as it has been found that both are essential, and in the conditions under which circulatory failure occurs both are equally operative in so far as the capillary circulation is concerned. Here we have a state in which the flow of blood through the functional portions of the kidney is at a low ebb. The glomerular as well as the tubular function is impeded. It would seem as if a normal balance would result. But, the fact remains that the urine is scanty and concentrated and there are all the evidences of a quantitative renal insufficiency. This, however, is most pronounced in so far as the water and salt secretion is concerned. The other symptoms of circulatory failure (œdema) contribute to accentuate this conclusion. The question arises as to whether this is purely a circulatory or a renal deficiency. The evidence, I think, indicates that it is primarily circulatory and secondarily renal. A vicious circle has been produced.

An additional light has been thrown on this phase of renal function in man by the finding that acute oxygen want leads to a decrease and even cessation of renal function. Krogh¹ has shown that under such conditions there is a dilatation of the capillaries. But in spite of this the renal function fails. It is reasonable to suppose that this result is consequent upon the secreting cells being deprived of one important functional necessity, namely, oxygen.

It is now necessary for us to consider the much more complicated subject of the estimation of the functional efficiency of the kidney. In general it has been based upon the degree in which the kidney fails to carry on its normal work. The more usual tests depend upon the abnormal accumulation of nitrogenous substances, such as urea, creatinine or uric acid, or of chlorides in the blood. Its power of maintaining the fluid equilibrium has been determined by the variations in fluid output and concentration during a twenty-four hour period.

As a consequence, these functions have received a great deal of attention while, in comparison, the maintenance of the acid-base equilibrium and the fixed basic balance of the blood has been neglected. It has been customary to suppose that all cases of so-called uræmia have an associated excess of acid ions in the blood and tissues. In fact it has been claimed by some that this is one of the important factors in the production of uræmic symptoms. It is with this aspect of the subject that I wish to deal this evening.

The symptoms produced by a relative predominance of the acid ions in the blood and tissues are to be found almost solely in the respiratory system. The principal one is hypernœa proportionate to the degree of acidosis. In mild or in early cases this increase in the pulmonary ventilation may be so moderate as to pass unnoticed except by those who are accustomed to a careful estimation of the respiratory effort. As the acidosis becomes more pronounced the hypernœa increases until dyspnœa and even panting may develop. It is only in the most severe cases that the respiratory rate is increased, when this occurs it indicates that the pulmonary ventilation is reaching its maximum efficiency.

In addition to the hypernœa, cyanosis may develop. This is not due to any pulmonary lesion but occurs in spite of the increased alveolar ventilation. It is of a pale grey or violet tint and is usually a terminal manifestation. Whether it be altogether due to the change in the oxy-hæmoglobin curve, which is a result of the acidosis, is not clear. When the eH of the arterial blood increases the hæmoglobin has a decreased capacity of combining with oxygen, therefore there may be an increased amount of reduced hæmoglobin in the capillary blood. At the same time, although the oxy-hæmoglobin may give up its oxygen more readily to the tissues it is at a lowered partial pressure. In this manner the cells may suffer from an oxygen want. To what extent this may be carried before severe cellular damage occurs is not at present known. There is evidence which would suggest that the central nervous system may be so seriously affected, either from this or from some other cause, as to fail to respond to normal stimuli. The following case may be taken from amongst others to illustrate this point. A male, aged nineteen, who was apparently suffering from a chronic productive nephritis with secon-

dary contraction was admitted to the Royal Victoria Hospital on November 29, 1924. There was moderate œdema of the face, semi-consciousness, a history of convulsions, and almost complete anuria for some days. Shortly after admission he voided 300 cc. which contained much albumin, pus and casts. He remained practically anuric until death on December 4, 1924. The cardio-vascular system was normal; the blood pressure being systolic 145 mm. Hg and diastolic 56 mm. Hg.

The blood, on admission, showed a severe grade of nitrogenous retention, the urea nitrogen being 254.8 mgms. per cent., the creatinine 16.6 mgms. per cent., and the uric acid 13.3 mgms. per cent. These values steadily increased until the day of his death when the creatinine was 21.4 mgms. per cent. and the uric acid 17.3 mgms. per cent.

On admission, the carbon dioxide combining power was 17.4 cc. vol. per cent. at 40 mm. CO_2 pressure. This indicated a pronounced reduction in the alkaline reserve but there was no hypernœa, the respirations being eight to ten per minute and of a sighing character. Their volume could not be estimated as the patient would not tolerate a mask or mouth-piece. Di-sodium phosphate, (2 gms. every hour) was given with a subsequent rise of the carbon dioxide combining power as follows: 30.11.24—30.9 cc. vol. per cent.; 1.12.24—33.2 cc. vol. per cent. On December 1st the respirations had become obviously shallower and reduced to six per minute with periods of apnœa. The phosphate was therefore discontinued. The CO_2 combining power continued to increase on December 2, 1924, to 38 cc. vol. per cent. but on the day of death had returned to 30 cc. vol. per cent.

The degree of acidosis in this case should at all times have been sufficient to produce a severe to a moderate hyperpnœa. But this at no time was present. In fact, as the carbon dioxide combining power increased the pulmonary ventilation obviously decreased, indicating a diminishing respiratory stimulation. It appeared as if the respiratory centre required a greater stimulation than normal. The reason for this was not clear.

On December 1st, (the date of discontinuance of the phosphate therapy) the inorganic phosphates in the blood plasma were 7.35 mgms. per cent.; the chlorides were 0.577 gms. of NaCl. per cent., while the calcium was 3.78 mgms. per

cent. and the sodium, 386 mgms. per cent. On December 3rd the first opportunity was obtained to examine the urine. It was found to contain a large amount of albumin, casts and pus. The ammonia output was found to be only 0.00616 per cent. These findings will be referred to later. The post mortem revealed a productive nephritis and the microscopical examination showed extensive reconstruction of the kidney parenchyma.

The estimation of the exact degree of disturbance of the acid-base equilibrium in cases of *nephritis* may be determined by one of several methods—either by the carbon dioxide combining power of the blood, by a determination of the carbon dioxide partial pressure in the alveolar air, or by a direct estimation of its hydrogen-ion concentration of the blood with a potentiometer or colorimetrically after the methods of Dale and Evans³, or of Cullen⁴. In addition to these, Barcroft⁵ has advocated the use of the oxy-hæmoglobin dissociation curve.

If the carbon dioxide combining power of the whole blood or plasma at any given partial pressure of CO₂ be less than normal, then it may be surmised that there is a relative lack of basic ions. The greater the lowering of the CO₂ combining power the more acidosis may there be assumed to be. The CO₂ combining power may be estimated by a number of different methods. The most frequently used are the van Slyke and the Haldane blood gas apparatus. If the carbon dioxide combining power of the blood of an individual be known, it is possible to calculate the pH of the blood at any given carbon dioxide pressure, or with any given carbon dioxide content, by means of Hasselbach's formula:

$$\text{pH} = \text{P}_k + \log \left(\frac{\text{Combined CO}_2}{\text{Dissolved CO}_2} \right) \quad \text{P}_k \text{ being}$$

a constant and approximately equal to 6.1.

When an increase in the acid ions or a relative decrease in basic ions occurs in the blood or tissues, the body immediately attempts to remedy this abnormal condition. This endeavour would appear to be accomplished in one or more of the following ways:

- 1.—Increased elimination of CO₂ by increased pulmonary ventilation;
- 2.—Removal by the kidney of inorganic acid ions in the form of chlorides, sulphates and phosphates;

3.—An increase of the excretion of ammonium salts at the expense of the urea excretion;

4.—The mobilization of basic ions from regions of the body from which they may be best spared.

It should be appreciated that the arterial and venous blood reflect up to a certain point the condition present in the more important functioning tissues of the body. This would appear to be particularly the case in so far as the nervous system, the cardio-vascular system, and certain parenchymatous organs are concerned. In considering the disturbances of the acid-base equilibrium in nephritis the problem is simplified by the fact that there is no evidence which would suggest that there is any formation of abnormal acid bodies as occurs in many other pathological conditions. Here we are dealing almost exclusively with some inability to excrete normally the acid ions alone or in proper proportions to the basic ions.

In mild and moderate cases of nephritis the acid-base equilibrium is apparently maintained without difficulty. It is only during periods of acute exacerbation of a chronic lesion or in chronic cases where the kidney function is permanently failing that signs of acidosis develop. The earliest sign of this development is an increased respiratory effort. By this means the alveolar carbon dioxide partial pressure is lowered with a consequent reduction of the carbon dioxide in the arterial blood, which leads to an excessive removal of this diffusible gas though weak acid from the tissues. It is also found in these cases that the basic ions are relatively less than normal as is indicated by a deficient power of the blood to combine with carbon dioxide. The manner in which this relative or absolute lack of basic ions is brought about is one of the most important points in this subject. It has been shown by Denis⁶ that the kidney has greater difficulty in excreting sulphates than it has in dealing with other inorganic bodies, while Denis and Hobson⁷ found a conspicuous increase of the inorganic sulphates in the blood of nephritic and cardio-renal cases. They found, however, that this retention was not directly proportional to the decrease in the carbon dioxide combining power or alkaline reserve. Therefore, this could not account altogether for the symptoms of acidosis. In some of their cases where there was a pronounced decrease of the alkaline reserve,

the increase of the sulphates was not so conspicuous as in other cases where the sulphate increase amounted to about 3,000 per cent. with but a moderate reduction in the carbon dioxide combining power. On the other hand, two cases with a normal sulphate content of the blood had practically the same carbon dioxide combining power as had other cases with a very pronounced sulphate retention. The same lack of parallelism was found between the inorganic phosphates and the alkaline reserve.

In regard to phosphates, Fetter⁸ has shown that in chronic nephritis without acidosis there is very little or no increase over normal of the inorganic phosphates in the whole blood, while the relation of inorganic to total phosphates maintains the normal ratio. On the other hand, he found in cases of nephritis *with* acidosis that, while the total phosphates of the whole blood were not necessarily above normal, the inorganic phosphates were conspicuously increased and that the ratio of total to inorganic phosphates was much disturbed. It would seem from his figures that the greater the reduction in alkaline reserve the closer to unity did the ratio between the inorganic and the total phosphates become. The exact explanation of these results is not clear. As Fetter remarks, "the high value of the inorganic phosphates suggests strongly that this substance is being mobilized to maintain the reaction of the blood within physiological limits." If this be the case it is quite within the realms of possibility that a point would be reached where there might be a relative super-retention of phosphates within the tissues on account of this excessive mobilization in the blood. However, the presence of an increase of inorganic phosphates in the blood would not necessarily, of itself, indicate an increase of acid ions due to this substance.

The importance of the phosphates as buffers in the blood and tissues is well recognized. Before an increase of phosphates may be held responsible for an acidosis it must be determined whether they are present as the alkaline or acid phosphate. Under normal conditions it is found that the base bound by phosphoric acid in the body fluids at a pH of 7.4 is in the ratio of 1 part acid sodium phosphate to 4 parts alkali-

line sodium phosphate $\left(\frac{\text{NaH}_2\text{PO}_4}{\text{Na}_2\text{HPO}_4} = \frac{2}{8} \right)$

Therefore, an increase in the inorganic phos-

phates is not necessarily indicative of an acidosis, particularly if the urinary excretion of phosphates is decreased, as in the urine the vast majority of the phosphate appears as acid phosphate. Indeed, it might indicate, as Fetter has suggested from the evidence of certain of his cases, that there may be a potential phosphate deficiency although the concentration of inorganic phosphates in the blood may be increased.

The exact rôle of the excretion of ammonia by the kidneys is not at present clear. It is well known that ammonia is excreted in large quantities by the normal kidney in order, apparently, to relieve the excretion of the more fixed bases. On the theory of Benedict and Nash⁹ that ammonia is formed in the normal kidney and is then excreted, it has been held by some that in nephritis this function would be interfered with. Indeed, observations have been made in this department which would indicate that this were the case. It is not unusual to find cases of "uræmia" in which there is a pronounced reduction of the bicarbonate reserve but in which the urinary output of ammonia has been reduced to an almost negligible quantity. In the case already cited this was quite obviously so. Other cases might be given to corroborate this finding.

When ammonia secretion is suppressed the only method left whereby the kidney can excrete acid radicals is in combination with the fixed bases; therefore, one would expect in time to see a disturbance of the basic equilibrium. It must be borne in mind that it is important not only to consider the total quantity of each base but also the ratio of one to the other.

A fair number of determinations of the bases in the blood serum or plasma have now been reported. Amongst these several points of importance have been shown. In the first place the frequent (in some series almost constant) reduction in the calcium content has been most striking. On the other hand, the potassium concentration has been found to be fairly constant by Myers and Short¹⁰ and by Denis and Hobson⁷; while Rabinowitch¹¹ in a series of cases of nephritis and eclampsia found five with a conspicuous increase in the potassium of the serum. In regard to the sodium, the variations in some series of cases is much greater than in others. That this may be due to differences in methods is suggestive that too much care cannot

be taken in accuracy and that this should not be allowed to suffer for the doubtful virtue of rapidity and ease of technique.

The question still remains to be answered, "What is 'uræmia'?" Its diverse manifestations would lead us to suspect that it might not be due to one cause only. In a general way there is a similarity from case to case, but many of these features are to be found in cases where there is nothing that would lead us to suspect an interference with renal function. Cases of "uræmia" may be associated with œdema, acidosis, vomiting, convulsions, and coma, or any combination of them; the absence of some is of frequent occurrence. In fact, we are dealing with a potpourri of symptoms without a clear-cut individual etiology and classification. Before we may be able to outline a rational method of treatment it is necessary to be sure of our facts.

The balance of evidence at present suggests strongly that the retention of nitrogenous bodies does not in itself produce the uræmia symptoms, although they may give a good indication as to how serious is the disturbance of the renal function. In reviewing the question there would appear to be three important ways in which the disturbance of renal function may seriously impair the internal equilibrium or environment of the cell which, in the final estimate, is the important unit of biological function. As yet we can only guess at the cellular disturbance by drawing analogies from the condition of the blood and how the organs respond to variations in the composition of this almost universal medium. That the blood reflects accurately the cellular constitution is doubtful under normal conditions and much more so under abnormal.

The three most important ways in which the blood may be altered in the present instance is through (1) a disturbance of the water balance; (2) a disturbance of the acid-base equilibrium, and (3) an alteration in the relative proportions of the inorganic (and also probably organic) constituents of the body fluids.

We find that a disturbance of each one of these functions is intimately related to the others. But they do not necessarily all develop at the same time, nor do they produce the same degree of bodily disturbance. It would almost seem as if their ease of production was in inverse ratio to their deleterious and disturbing influence. The

relative importance of these functions is well described by Macallum¹² in the following words:

"The capacity of the organism to make and keep its own internal medium uniform gives an enormous advantage to it, for it can change its habitat and adapt itself to a new environment without affecting the stable conditions under which its own tissues and organs do their best work. The organ which enables the organism to maintain these paleoceanic conditions is the kidney and this was its first function. The firmly fixed physiological habit or function must be the more ancient one, and consequently the earliest function was not the elimination of waste metabolic products, but the regulation of the inorganic composition of the blood."

On the other hand, Haldane has repeatedly pointed out the enormous facility which the organism has of changing its constitution up to a point to meet new conditions of environment. This process can only proceed to a certain degree and if given time. If pushed beyond this point the corrections may become harmful in themselves.

Is this what occurs in nephritis? Does the body endeavour to maintain as far as possible the acid-base equilibrium in the arterial blood and in the tissues, and in attempting this does it violate another principle of greater importance; namely, the proper balance of the inorganic constituents of its internal medium? As so frequently occurs in disease, has the correction of one balance led to the disturbance of a more important one? And is the explanation of the symptoms of uræmia to be found in a combination, in different proportions in different cases, of disturbances of these three important biological equilibria?

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THE DETERMINATION OF KIDNEY FUNCTION IN PRIVATE PRACTICE*

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IN discussing this subject before this gathering,

I shall endeavour to make my remarks of as practical a nature as is possible and I shall confine myself entirely to a review of those diagnostic measures which we can use in our non-hospital work without special training, without apparatus and without consuming too much of our valuable time. I wish to emphasize certain procedures which are frequently performed in hospital investigations, but which have not, apparently, been generally adopted in office work. My remarks will be confined chiefly to the study of chronic and subacute nephritis. A case of acute nephritis should not be investigated too vigorously. An acute case needs treatment and rest. It will be time enough later to estimate the damage when as much repair as nature can accomplish will have taken place.

We all see cases wherein we feel that an exact knowledge of the kidney function would be of the greatest importance in diagnosis, in prognosis, and in treatment. The question of high blood pressure has made such an impression on the minds of the laity that we are being constantly asked, "Is my pressure serious? Must I give up work?" etc. And we must answer these questions. *This* man has chronic interstitial nephritis and cannot live six months; *that* man has a higher blood pressure but a normal kidney and will probably live ten or twenty years.

To use our functional tests intelligently, we must have a clear conception of the function of the various kidney structures. Many theories are held but I believe that the majority of the authorities are now endorsing the Cushny-Ludwig or the *filtration-absorption* theory. That is, we believe that the glomerulus filters through a dilute solution of the urine containing all the soluble constituents of the blood, except albumin, in the same concentration as in the blood. When

this solution reaches the tubules, water, sugar and other useful ingredients are reabsorbed by a selective process thus raising the concentration. The *secretion* theory, though not widely held, is still supported by several of our authorities who feel that the filtration theory has not yet been fully proven by pathological findings or otherwise.

Bearing these factors in mind, our study resolves itself into answering three questions:

1.—How much information can we get from our ordinary routine tests?

2.—What special tests are indicated in each individual case?

3.—How shall we interpret these special tests?

Routine Albumin Tests.—In chronic cases, our routine albumin test tells very little. In the first place, the worst cases of chronic nephritis may show no albumin. As you know, we have two main types of chronic change: (a) The hydræmic type, with œdema, moderate blood pressure and heavy albumin precipitate, and (b) the azotæmic type, with no œdema, high blood pressure, high nitrogenous retention in the blood and very slight amounts of albumin. It is this factor which makes our usual life insurance urinalysis really a joke. In the second place, a patient with albumin in the urine should not be condemned to a life of invalidism. Albumin may only mean passive congestion of the kidney; it may be orthostatic; it may mean pyelitis. In nephritis, albumin usually means an increased permeability of the glomerular filter, but in the more acute cases, it may be an inflammatory exudate from either the tubules or the glomeruli.

Microscopic Examinations. — If a kidney change is suspected, several investigations should be carried out.

In all ways the most important is a microscopic examination of the urine. In chronic cases this means far more to me than the albumin test. It is true, many men do not own

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microscopes, but I think that it is an investment every one should make. The university is making it obligatory for all medical students entering this fall to have their own. If one does not have a centrifuge, results almost as good can be obtained by allowing the urine to stand for from six to twelve hours. The sediment may then be examined for casts and cells.

When doing a microscopic examination, several points are worth remembering:

1.—Casts may be dissolved if the urine has become ammoniacal.

2.—Never make a diagnosis of pyelitis in females unless a catheterized specimen of urine has been procured.

3.—A few hyaline casts in elderly people may mean very little, but granular casts usually indicate some nephritis. A hyaline cast is precipitated protein from the glomerulus or tubule. If covered with desquamated epithelial cells, it is an epithelial cast; if these cells are degenerated, it is a granular cast.

4.—Do not omit the microscopic test because there is no albumin. This is a most pernicious practice, especially in dealing with adults.

In chronic cases, I feel that the estimation of the *specific gravity* is the most valuable study which we can make. In fact, I feel that it gives us the most important information. This test is usually combined with a study of the volume output in several ways.

Normally, water is largely excreted within a few hours after ingestion. If the kidney is damaged, water excretion is delayed and the kidney works overtime, increasing the amount of the night urine. Therefore, a simple division of urine into two twelve-hour periods, eight p.m. to eight a.m., with no liquids after supper, should give a night urine of less than half the day urine and a volume of about 400 cc. The night urine should also have a higher specific gravity, i.e., of 1,018 or 1,020 at least. If kidney function is lowered, the first signs are in the night urine; the quantity is increased and the specific gravity lowered.

Two-Hour Test.—A still better method which can be performed at home by any intelligent layman is a modified "two-hour test." I instruct the patient to eat an ordinary meal at 8.30 a.m., 12.30 p.m. and 6.30 p.m. The time is very important. Also, one must emphasize that they drink freely at meals, drinking at

least two cupfuls, preferably three, and take nothing between meals nor at bedtime. The bladder is emptied at 9 a.m. (after breakfast) and then specimens are collected every two hours until 9 p.m., i.e., six specimens. All the night urine from 9 p.m. to 9 a.m. is also collected. I usually ask them to measure the amount in each two-hour period with an empty six-ounce medicine bottle which I give them. I give them one with the measurements embossed on the back for their convenience. They send me only part of the amount with the hour and the full amount written on the label. Next day the seven bottles are brought to the office.

Now for the interpretation. The water is excreted before the nitrogen. Therefore, the samples immediately following the meals should be larger in quantity and lower in specific gravity than those before meals. Also, there should be a variation in the specific gravity of the day samples of at least eight points and preferably ten. If these findings are normal, there is probably no permanent damage done to the kidney despite high blood pressure or albumin. Table I. illustrates these normal variations. This patient, by the way, has a blood pressure of over 200 and has had very high pressure for years. I have given her a good prognosis.

TABLE I
Two-Hour Test

Mrs. A.	Sample	Amount	Specific Gravity
Breakfast:			
8.30-9 a.m.	9-11 a.m.	450	1,008
	11-1 p.m.	127	1,018
Dinner:			
12.30-1 p.m.	1-3 p.m.	225	1,012
	3-5 p.m.	100	1,022
	5-7 p.m.	90	1,023
Supper:			
6.30-7 p.m.	7-9 p.m.	510	1,008
		1,502	
Night Sample.	9 p.m.-9 a.m.	705	1,018

Note the large volumes of urine following meals, the marked variation in specific gravity readings during the day, the ratio of day to night volumes and the night specific gravity of 1,018. The water intake was higher than necessary.

If there is a narrowing of the range in the specific gravity readings (say they are all around 1,014-1,018), we suspect functional impairment. Fixation at high levels is common in passive congestion. Fixation at low levels (1,010-1,014) means a severe kidney impairment. Uræmia gives a fairly even specific gravity. The earliest sign is a loss of variability. The amount may vary greatly and the specific gravity very

slightly, e.g., 200 cc., S.G. 1,1014; (next hour) 500 cc., S.G. 1,015. Also there may be nine or ten point variation between two of the specimens, but the remainder may be fixed. Be sure to have a moderate amount of fluid—not too much nor too little—or the test is spoiled.

If the night sample be more than one-half the day sample, or the specific gravities be all rather fixed (say 1,014-1,019), one thinks at once of delayed water excretion. These cases frequently have nycturia. If retention is present, the patient should be catheterized.

Water Test.—To check up on the water excretion, we do the *water test* which is quite simple (Table II). We give three pints of water in one-half hour and take samples of urine every half hour for two hours, every hour for the third and fourth hour, then collect all up to twelve hours and then the remaining twelve hours as a separate specimen. The amount and the specific gravity of each specimen are taken. Nor-

TABLE II
WATER TEST

Mrs. A.		Specific Gravity
Control sample taken before 8.30 a.m. . .		1,026
Three pints of water (1,500 c.c.) given between 8.30 and 9 a.m.		
Samples:		
9.30 a.m.	240 c.c.	1,007
10.00 a.m.	315	1,004
10.30 a.m.	360	1,005
11.00 a.m.	310	1,004
12.00 a.m.	445	1,007
1 p.m.	220	1,006
	1,890 c.c.	
1-9 p.m.	525	1,013
9-9 a.m.	420	1,023
	2,835	

Diagnosis: Hyperpiesis

Note the free flow in the first four hours and the low specific gravity readings of 1,002 and 1,003 are common. This patient drank more than 1,500 c.c.

mally about 1,000 to 1,200 cc. should be excreted in the first four hours and the specific gravity should drop to 1,003 or 1,004. I have frequently seen it lower. The night twelve hours specimen is usually above 1,015. A glomerular change shows a delayed excretion and the minimum specific gravity not below 1,006 or 1,007; i.e., if the kidney cannot dilute, the glomeruli are damaged and cannot excrete water nor salt. Table III illustrates the poor response to these tests in a case of chronic glomerulo-nephritis with prostatic obstruction.

Concentration Test.—Advanced tubule degeneration is usually indicated by an inability of the kidney to concentrate. The *concentration test*

TABLE III
PROSTATIC OBSTRUCTION

Patient D.	Two-Hour Test	Water Test
	Specific Gravity	Specific Gravity
Control.	1,016	Control. 1,016
9-11 a.m.	41 c.c. 1,019	9-10 a.m. 120 c.c. 1,013
11-1 a.m.	58 1,021	10-11 a.m. 210 1,006
1-3 p.m.	43 1,020	11-12 a.m. 270 1,006
3-5 p.m.	72 1,020	12-1 a.m. 150 1,010
		(4 hours. 750 c.c.)
5-7 p.m.	57 1,021	
7-9 p.m.	95 1,021	1-9 p.m. 275 c.c. 1,016
Day.	346 c.c.	
Night.	650 c.c. 1,017	9-9 a.m. 820 1,016
Diagnosis:	Chronic glomerulo-nephritis, passive congestion.	

Note the fixity of the volume and the specific gravity readings in the two-hour test. The samples following meals are underlined. The ratio of day to night volume is reversed. In the water-test, the four-hour output is low and the *specific gravity* does not fall to 1,004. Much of the water is not excreted until night. My advice to the surgeon was to delay prostatectomy and institute pre-operative preparation.

is here of value and may be done where the specific gravity in previous tests has been found low or there is a large night output. In this test we simply ask the patient to take as little fluid as possible and as much protein as possible for twenty-four hours. That means no free fluid, ice to suck if thirsty and a diet of meat, cheese, eggs, beans, bread, etc. By the end of the twenty-four hours, the specific gravity should be at 1,030. If the kidney cannot concentrate, we know there must be severe tubular damage. We also know that the nitrogen is not well excreted.

Phenolsulphonphthalein Test.—The question of doing the phenolsulphonphthalein test comes up. Opinions vary as to its efficacy, but recent work by Bieter and Hirschfelder has proven that the phenolsulphonphthalein is excreted by the glomerulus alone and therefore this test gives an excellent indication of glomerular involvement. This test can be performed at home and the urine taken to the hospital for colour estimation. Or if one puts 1 cc. of the dye into a litre of the patient's urine saved from the previous day and adds alkali to bring out the colour, one has a standard reading 100. By juggling dilutions, one can estimate what percentage of this is passed in the three-hour period following dye administration. I prefer the three-hour estimation rather than the two-hour period described in text books.

Frequent sources of error are to inject the whole ampoule contents instead of exactly 1cc ;

to inject into the fat or fascia instead of the muscle—intravenously is best; incomplete recovery from the bladder due to a cystocele or an enlarged prostate.

Blood Chemistry.—One does not like to call a kidney examination complete without a blood chemistry estimation. This, of course, should be attempted only by experienced laboratory workers but every practitioner should know how to collect the blood and what tests to request from the laboratory. Many samples are spoiled because several simple rules are not followed:

(a) The blood should be collected before taking food in the morning.

(b) The blood must be oxalated and well shaken. Many specimens are useless through being clotted. Two drops of a saturated potassium oxalate solution to every 5 cc. of blood will suffice, or two drops of a saturated sodium fluoride solution will keep the blood longer if it has to be mailed. The latter is best for blood sugars.

(c) Use precautions if the blood cannot be analyzed in a few hours. Also, find out in advance on what days your laboratory does its blood chemistry.

(d) Send sufficient—at least 5 cc.. Send more if you want several tests performed.

In requesting analyses, bear these points in mind:

Uric acid is the first nitrogenous element in the blood to increase. Later it is not so important. Therefore, this may be done in the incipient cases.

Estimations of urea and non-protein nitrogen are most frequently requested; they have almost the same significance in nephritis. Therefore, request but one. A raised blood urea means bilateral kidney disease. Thus, it is of value to surgeons in renal calculus or a "surgical kidney."

Creatinine is the last nitrogenous element to

rise; its increase in the blood is a most serious sign and if the reading goes to 6 mg. per 100 cc. plasma (normal is 1 to 1½), the patient will die.

General Observations.—In conclusion, certain general observations might not be amiss:

1.—Do not do a water test in the presence of much oedema or if the oedema is being rapidly reduced by excretion.

2.—Do not do a concentration test if your patient is very ill or is bordering on uræmia.

3.—Do neither of these tests if the condition is recent and still acute. These tests are for chronic cases.

4.—We seldom see a purely glomerular or tubular lesion except in acute or incipient cases. Most chronic changes show some involvement of all the kidney structures.

5.—There is such a wide margin of safety that incipient or slight changes in the kidneys are not indicated by tests. For instance, three-fifths of the kidney tissue must be destroyed before the blood urea is raised. These tests are more to estimate the extent of the damage done. Also, it should be remembered that focal nephritis may give albumin, pus, and blood in the urine without in any way affecting the kidney function. This is due to the wide margin of safety provided by nature.

6.—Prostatic cases should be thoroughly investigated. Many times the first results of tests appear worse than they really are, due largely to the passive congestion.

7.—It is a long way from the kidney to the eye, but an ophthalmoscopic examination is advisable in every suspected case. To study the retina is like holding the divided kidney in your hand.

8.—Finally let us remember that our aim is not so much to determine the pathological picture present in the kidney but rather to estimate its *ability* to perform *work*.

Bovine Tuberculosis.—The Royal Commission of 1911 had disproved Koch's statement that this form of tuberculosis was not a serious menace to man. In a recent investigation by Griffiths (*Lancet* 1, p. 491, March 7, 1925), the bovine bacillus was found in 85 per cent. of cases of

gland tuberculosis in children under five years of age; in bone and joint tuberculosis 30 per cent.; in lupus 66 per cent.; and in meningitis 66 per cent. These findings emphasize the urgent necessity for the pasteurization of milk. —S. M. Fisher in *Harvey Club Bulletin*.

QUINIDINE SULPHATE IN CARDIAC IRREGULARITIES

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DURING the past seven years keen interest has been taken in the action of various quinine derivatives in abolishing cardiac irregularities and restoring the normal mechanism. The irregularities most intensively studied have been auricular fibrillation and auricular flutter. More recently the treatment of patients suffering from paroxysmal tachycardia and ventricular premature beats has given encouraging results.

Frey, in 1918, investigated the efficiency of the various cinchona derivatives, and found that quinidine was the most constant in its action when administered to patients with fibrillation and flutter, and that the sulphate, being the more readily absorbed, was of greater value than the pure alkaloid.

Later, Lewis and his co-workers published the results of their investigations regarding the nature of flutter and fibrillation of the auricles. Their conclusions, as to the establishment of a circus movement within the auricle in both of these irregularities, have come to be universally accepted, and are now well known. Lewis pointed out that in the maintenance of the abnormal rhythm three essential factors are involved: (1) the length of the central path; (2) the rate at which the wave travels; (3) the duration of the refractory period. It is to be seen that these three factors must be in such relation to each other that the circulating wave of excitation, as it advances, must always find just ahead of it muscle which has had a sufficient period of rest to restore its excitability following the refractory state, and so be ready to respond to a stimulus for contraction. If, in this circus movement, any means could be discovered which would bridge the gap between the wake and advance of the circulating wave, fibrillation or flutter, as the case might be, would be terminated. Briefly, prolongation of the refractory period in the muscle, or sufficient quickening in the rate of conduction within the circle,

would terminate the circus movement.

It has been demonstrated that quinidine lengthens the refractory period and, at the same time, slows conduction. Lengthening of the refractory period would tend to abolish the circus movement. Slowing of the conduction rate, on the other hand, would widen the gap between successive waves, and thereby more firmly establish the circus movement. Thus, in the results obtained from the administration of quinidine two opposing factors are at work and the outcome must depend upon which of these gains the ascendancy.

Sufficient clinical evidence has now been accumulated to demonstrate that, in between 50 per cent and 60 per cent of patients suffering from fibrillation of the auricles, normal rhythm can be re-established by the oral administration of quinidine sulphate.

During the past four years in the Toronto General Hospital, fifty-two patients have been given quinidine sulphate. Of this number, forty-nine were suffering from auricular fibrillation and three from paroxysmal tachycardia. In those patients having fibrillation the diagnosis was confirmed in all but one by electrocardiogram, and in the great majority frequent electrocardiographic studies were made. The establishment of the normal heart mechanism was also confirmed by electrocardiograms. The age of the youngest patient treated was twenty-seven years, the oldest being eighty-six. The majority were under fifty years of age. The sexes have been fairly equally divided—males slightly predominating. At the time of commencing quinidine treatment thirty-one of the forty-nine cases showed at least one of the signs of failure as exemplified by oedema, passive congestion of the lungs, or enlargement of the liver. All had some limitation of cardiac reserve, the majority to quite a marked degree. A number of the patients treated had formerly been under observation while their heart rhythm was nor-

mal. In these a fairly definite date for the onset of fibrillation was ascertainable. In the remainder an attempt was made to fix the date of onset from the history of the appearance of more acute symptoms of myocardial disease, e.g., palpitation, increased shortness of breath, œdema, etc. Estimated thus, the duration of fibrillation in the patients treated ranged from a few days to about six years.

All of the patients, except two in whom the total transverse diameter did not exceed 12.5 cm., had enlargement of the heart. The degree of enlargement was demonstrated in almost all (except six) by orthodiagram or teleoroentgenogram. The heart rate, as recorded at the apex by auscultation at the time of commencing the quinidine sulphate, varied in the different patients from 45 to 160 per minute.

The majority of the patients treated received a preliminary course of digitalis. No definite plan was followed in the administration of digitalis but, where the patient appeared acutely ill and symptoms were largely due to myocardial failure, digitalis was given for several days, or until the urgent symptoms had disappeared. There appears to be no contraindication to the giving of digitalis immediately before or even during the administration of quinidine. In none of the cases cited have digitalis and quinidine been given concurrently. Such a method of administration, however, is stated to have the advantage that, in the patient who is moderately digitalized, the ventricular rate is more readily controlled and there is not the same tendency to a marked increase in its rate which occasionally occurs when quinidine alone is given.

The drug was, in all instances, administered by mouth, and in this a definite rule of procedure has been followed. This was to begin with a dose of 0.2 gm. on the first day, and if no toxic symptoms developed, gradually increasing the dose up to the fourth or fifth day when the maximum dose of 1.6 gm. or 2 gm. might be given in each twenty-four hour period. The maximum action of the drug is of short duration and the best results seemed to be obtained from small doses of 0.2 gm. or 0.25 gm. given at three-hour intervals throughout each twenty-four hour period.

Of the forty-nine cases of fibrillation reported twenty-six reverted to normal rhythm, i.e., 53 per cent of the total. The permanence of nor-

mal rhythm has varied from a few days to two years. In the majority fibrillation has reappeared within several weeks; a number of this latter group have had two or more courses of treatment with varying success. Once the normal mechanism is established the most permanent results have been obtained by continuing to give daily small doses of quinidine. We have at present two patients who have maintained a regular rhythm by this means for a period of more than two years.

From a summary of the cases treated, it may be said that even a careful study of the patient, and of his history, fails to give sufficient information to permit of an accurate forecast regarding the ultimate effect of the drug on the cardiac irregularity. In the cases under consideration, slightly better results were obtained in those patients in whom no valvular defect was demonstrated; also, it would appear probable that the cases of long duration may not respond so readily. The results in patients having a rheumatic or other infective origin, and those having arteriosclerosis, for their possible causation appear about equally divided. Blood pressure variations, size of heart, and heart rate, would not appear to have any bearing on the result.

Considering the clinical results obtained from the use of quinidine; the immediate effect of return of normal rhythm has usually been increased comfort for the patient, there having been either total cessation or marked diminution of palpitation. Frequently their respirations have been more comfortable. Their general appearance seemed improved and their convalescence was apparently shortened. In those patients, however, in whom records of vital capacity were made no consistent change in the readings were noted on the return to normal heart rhythm. The moral effect of normal rhythm versus fibrillation might be a beneficial factor in some patients.

Among the cases recorded there have been, unfortunately, four deaths. The first fatality was in a man fifty years of age who had been under observation for one year, during all of which time he had fibrillation of the auricles. There had been no evidence of a valvular lesion and there was only a slight degree of myocardial failure. The ætiology of the fibrillation was uncertain. This man received a total of 3.8 gm. of quinidine in five days. His rhythm returned

to normal on the fifth day and his heart rate was 80. His condition appeared excellent and he said he felt much better. Except for an increase in his ventricular rate during treatment he had shown no toxic symptoms. He died suddenly ten hours after the return of normal rhythm. A complete autopsy failed to show the immediate cause of death.

A second death occurred in a woman of twenty-nine, who had rheumatic heart disease with mitral stenosis and moderate myocardial failure. She had been under observation in the hospital for fourteen weeks prior to giving quinidine. During the period of observation she had had a syncopal attack which had been diagnosed as hysteria. She received two doses of 0.2 gm. of quinidine with a twelve-hour interval between the doses. She died suddenly two hours after the second dose. No change had been observed in the heart's mechanism. An autopsy was not permitted.

The third patient who died was a man aged sixty, who had auricular fibrillation secondary to cardiovascular syphilis, with syphilitic aortitis and dilatation of the aorta, also aortic insufficiency, cardiac hypertrophy, and, on admission, a marked degree of myocardial failure. Following four weeks' rest in bed with digitalis, the gross signs of myocardial failure had disappeared. This man had been fibrillating when first seen one year prior to admission to the hospital. He had a strongly positive Wassermann in both blood and spinal fluid. He was the only patient of the entire series who had a positive Wassermann. In four days he received a total of 2.2 gm. of quinidine and his rhythm became normal, the only irregularity observed being occasional ventricular extra systoles. Because he showed a tendency to reversion to fibrillation, and no toxic symptoms were evidenced other than the premature beats, he was kept on several small daily doses of quinidine, and in eleven days received a total of 12.4 gm. He died suddenly without any preceding change in his condition. During the week prior to death he had been apparently improving and his condition had not at any time been a cause for anxiety. An autopsy revealed a marked degree of syphilitic aortitis with fusiform dilatation of the aorta. There were no thrombi in any of the heart chambers nor were emboli found.

The fourth death was in a man seventy years

of age, with auricular fibrillation, apparently secondary to arteriosclerosis and hypertension. He also had a moderate degree of myocardial failure. There was no evidence of valvular disease. Following several weeks' rest in bed with digitalis he was given quinidine. After six days, during which he received a total of 7.2 gm., his heart action became regular and the mechanism normal, except for a slightly prolonged A.V. conduction and that he had shown throughout a suggestive but not definite right bundle branch block. Prior to the giving of quinidine he had frequent ventricular extra systoles which became much less frequent under quinidine and almost disappeared with the normal rhythm. Following the appearance of the normal rhythm this patient was placed on small daily doses of quinidine. He felt better and looked better than he had at any time during his admission. He died suddenly. At the time of death he had not received a dose of quinidine for eighteen hours. His heart rhythm had been regular for seventy-two hours. A complete autopsy failed to show the cause of death.

I feel now that these last two patients should never have received quinidine. In the first place, both were suffering from myocardial failure of a degree, and from causes for which little benefit could be expected from the return to a normal rhythm; also, both received a fair degree of efficiency from rest and digitalis. The first two patients who died, however, appear to have been suitable cases for treatment. The exact cause of death was not discovered in any of the four and it must only be surmised. That the second case died from the effect of the drug seems most unlikely.

Of the three patients who were treated for paroxysmal tachycardia, one received no benefit; a second was very markedly improved; the third still under treatment, has had total freedom from an attack for seven weeks, which is an exceptionally long period for her.

One other condition in which quinidine would appear to be indicated, and in which it may find a large field of usefulness, is in those cases of auricular fibrillation associated with thyro-toxic conditions, especially perhaps, when fibrillation persists following operation, and when it would seem probable that normal rhythm once re-established might readily become permanent, the cause having been largely removed.

In a number of the patients treated evidences of the effect of the drug, other than the production of normal rhythm, have been observed. Some of these are probably of a toxic nature, and should be accepted as danger signals, and an indication for discontinuing treatment. The earliest of these symptoms to appear have been diarrhoea, epigastric pain, nausea, and ringing in the ears. These have occasionally been observed after a small total dose. Other symptoms appearing later have been palpitation, precordial pain or tenderness, marked increase in the ventricular rate, the appearance of ventricular premature beats, with, in several instances, coupled rhythm and changes in the character of the waves of the electrocardiogram, especially of the Q.R.S. and T. waves.

From a study of the results obtained, it would appear that, in carefully selected cases the use of quinidine sulphate in the treatment of the cardiac irregularities considered is justifiable. The most important contra-indication would

seem to be high grades of myocardial damage as demonstrated by either clinical or electrocardiographic examination. In such patients the symptoms complained of are likely to be due not so much to the arrhythmia as to the myocardial changes. Here the resumption of normal rhythm can give little or no improvement, also it is highly probable that these patients run some peculiar risk in the administration of quinidine. It is to be borne in mind that quinidine is a potent drug, sometimes acting rapidly, and occasionally accompanied by toxic symptoms which may be a cause for grave alarm. The production of embolism following the use of quinidine is the danger which has been chiefly emphasized. Judging from the fatal cases here reported, three of which came to autopsy, there must be some other factor, and probably the one suggested by Lewis, that with a changing rhythm there may be a ventricular standstill for a sufficiently long period to cause death, is the one to be feared.

ERYTHEMA NODOSUM

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THIS disease is usually only found described in text-books of dermatology, yet very few cases are seen by dermatologists as the man in general practice deals with the vast majority of such patients. In dermatological text-books, this condition is defined as an inflammatory disease of the skin with constitutional disturbance, shown by mild fever, malaise and joint pains. A better definition would be that it is a condition that manifests itself by more or less systemic disturbance, and a distinctive skin rash.

The skin lesions affect especially the anterior tibial regions, occasionally the extensor aspect of the forearms and rarely the skin elsewhere. The lesions assume the form of ovoid, tense, tender nodules from pea to walnut size; at first a shiny red colour, later deepening to purplish red. When close-set, the inflammatory zones of the nodules may coalesce. The numbers of

nodules show marked variations, as only two or three may appear or they may be very numerous. The nodules tend to come out in crops, so that in a case lasting two weeks or over, all stages of nodules may be seen. The disease attacks all ages, from childhood to old age, but the majority of its victims are between ten and thirty years, and females are affected in the ratio of four or five to one male. My youngest case was in a boy of six years, my oldest, in a woman of sixty-five. There are a number of problems that make the syndrome of considerable interest. The first of these is the etiological one. Is this disease, a distinct clinical entity (like measles, for example)? What relation does it bear to erythema multiforme, to erythema induratum (Bazin's disease), to the Osler nodes of chronic infectious endocarditis? Have rheumatic fever, syphilis, or tuberculosis any causal relationship.

Let us discuss these seriatim. In a recent

issue of the *British Medical Journal*, (Vol. I, 1925, page 651), Dr. Lendon, of Adelaide, Australia, again endeavours to show that erythema nodosum is a distinct disease for which he has proposed the name of nodal fever. He claims it follows a definite clinical course of prodromal, eruptive and febrile stages, followed by a period of convalescence, and shows little tendency to secondary attacks. Lendon first described it as such in 1905, and in this paper endeavours to show that he was justified in this description though I fear that the verdict will remain now as it did twenty years ago, viz., "not proven."

Many authorities in the past have held that erythema nodosum had a causal connection with acute rheumatic fever, pointing to the frequency with which the nodes have developed in patients who previously have had one or more attacks of acute rheumatic fever. The percentage of such cases certainly is appreciable as the figures run from 20 per cent. to as high as 40 per cent. The subcutaneous nodules seen so frequently in children who have had acute rheumatic fever have been held to be but a variant of the nodal lesions of this disease. I think we must admit that erythema nodosum does occur with greater frequency in those with a tendency to rheumatic fever than in those without such a taint, but I believe that such frequency is based on the known prevalence in such patients of foci of infection.

Again, certain clinicians have urged the claims of tuberculosis as a factor in the etiology of erythema nodosum. Without doubt this affection occasionally develops in a tuberculous subject or those with a tuberculous tendency, but so far as my own observations are concerned I am satisfied that the frequency is not greater in such patients than in the general non-tuberculous population. No doubt too, the relationship has been emphasized by an occasional instance of erythema induratum (Bazin's disease) that one meets in practice. The lesions in Bazin's disease are seen almost entirely on the legs below the knees but especially on the lower halves of the calves, these lesions being undoubtedly tuberculous in nature.

In a similar manner, erythema nodosum may develop in syphilitic subjects and a recognition of the syphilitic taint may materially assist in treatment of a case. Again, tertiary skin gummas or tibial periosteal nodes may be mistaken

for the lesions of erythema nodosum. It is exceptional, however, for the onset and clinical course of such a case to coincide with that of erythema nodosum, so that an error can only exceptionally be made.

Contrary to the experience of others, erythema multiforme, in my own cases, has never accompanied nor complicated an erythema nodosum case. Erythema multiforme is without doubt a toxic manifestation, while erythema nodosum in my opinion is a manifestation of an active infection.

All authorities discussing the pathology of the lesions agree that the nodes are infective in origin. Pusey (*Principles and Practice of Dermatology*) says: "the lesions represent infective infarcts in the corium" as the centre of the inflammatory nodule. Rosenow (*Journal Infectious Diseases*, Vol. XVII, 1915, page 367), describes the lesions as centering about bacterial emboli, especially in the veins, with endo- and periphlebitis. He further says that the early febrile attacks heralding the lesions are probably the time at which the organisms are free in the blood stream.

During the past five years I had had the opportunity of seeing a considerable number of cases of erythema nodosum in nurses in training, ordinarily a healthy lot of young women. Study of these cases has led me definitely to the conclusion that in erythema nodosum we have another manifestation of focal infection. Invariably where bacteriological examinations have been made streptococci have been readily isolated from the suspected points of origin and these have usually been the common focal sites, viz., the tonsils, the teeth or the nasal sinuses. During the past fifteen months nine nurses in training have developed this affection. All have had a history of occasional attacks of tonsillitis; seven had had such an attack within one month of the onset of the erythema nodosum, while the other two showed infected tonsillar crypts on throat inspection. In older subjects the teeth have been more often incriminated as a probable source. A good example was a woman of forty-eight who, about January 1st, developed iritis and erythema nodosum. No nasal or throat infection could be demonstrated but she had a poor looking lot of teeth which on x-ray showed at least six with root abscesses. Despite our findings the patient was loathe to part with her

teeth and held out for six weeks under general treatment with only slight improvement in her eye condition and recurrent crops of nodes on her shins. The infected teeth were removed and within ten days the nodes had cleared except for their stains and the eyes had ceased to require further treatment.

A recent case seen in a young woman of twenty-two is instructive. Ten days before she consulted me, she had had a sore throat and slight fever which cleared in two or three days. When she reported to me her shins showed multiple red, shiny, tender nodes; she was feeling miserable and she had a slight elevation of temperature. Inspection of the throat showed superficially all apparently well, but pressure on the tonsils brought up from one crypt about one quarter of a teaspoon of pus. This patient had

a tonsillectomy done which disclosed several such deep seated pus pockets. On the sixth day after the tonsillectomy she went back to her work, the nodes showing only as purplish red stains.

These and like cases have definitely satisfied me that erythema nodosum is but a manifestation of focal streptococcal infection in which tonsils, teeth and nasal sinuses play the important rôle of infective foci.

Treatment must therefore be primarily directed toward the discovery and removal of such foci. Treatment otherwise consists in rest with elevation of the limbs with the local application of heat. Internally the administration of salicylates seems to afford relief from pain and lessening of the local tenderness. I have, however, not found that the salicylates in themselves have any effect in cutting short the illness.

A SENSITIVE TEST FOR HEXYL-RESORCINOL IN BODY FLUIDS AND NOTES ON ITS APPLICATION*

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IN the search for an ideal antiseptic, Treat B. Johnson^{1,2} synthesized the lower homologues of a series of alkyl resorcinols which were tested bacteriologically by Rettger (cf. 2). Following the alkyl resorcinols further a very promising drug has been developed by Veader Leonard^{3,4} in hexyl-resorcinol. Its principal use so far has been in the treatment of infections of the urinary tract. This report will describe studies of the distribution of hexyl-resorcinol in the body based on the use of a new and sensitive test.

Absorption.—Hexyl-resorcinol first appears in the urine about one hour after oral administration. It is apparently at its greatest concentration between the second and third hours. Absorption from the gastro-intestinal tract was followed in an experiment with six dogs, each receiving one gram of hexyl-resorcinol in olive

oil (capsules) per kilo. of body weight. Between the second and third hours after administration, and while the animals were under morphine and ether anæsthesia, extracts were taken of the contents of various sections of the gastro-intestinal tract. The following results indicate the progressive diminution in concentration as shown by the colour test to be described:—Stomach, xxxx; duodenum, xxxx; jejunum, xxx; ileum, xx; ileum at the ileo-cæcal valve, x; cæcum and sigmoid, O. From this it appears that the absorption of hexyl-resorcinol after oral administration occurs primarily in the small intestine.

Body Fluids Tested.—The animals used in the above experiments were killed after three hours and attempts were made to determine the fate of hexyl-resorcinol in the body. The results of testing the blood serum and the following fluids were:—Blood serum, negative; blood, dialyzed for forty-eight hours, negative; bile, negative;

*These investigations were carried out as a part of the programme of the Sub-committee on Internal Antiseptics of the National Research Council of the U.S.A.

bile, forty-eight hours dialysate, negative; bile diluted with water (equal parts) and decolorized with animal charcoal, negative; liver substance (aqueous extract), negative; cerebrospinal fluid, negative.

The urine of each dog used in this experiment showed an abundance of hexyl-resorcinol. The question of excretion in the cerebrospinal fluid was considered so important that further tests were made in man. In three different men who had received 0.9 gram daily for five days, the test for hexyl-resorcinol in the cerebrospinal fluid on the fifth day was negative. The test was always positive in the urine of these men at the time of spinal puncture. So far, therefore, hexyl-resorcinol has been detected only in the gastro-intestinal tract and urine.

An Alkali-Chloroform Test and its Sensitivity.

—The test employed is a modification of one of the U.S.P. tests for resorcinol, some of which give no reaction for hexyl-resorcinol. The following we have found to be the most sensitive for the new drug:

To 2 cc. of urine or fluid to be tested add 0.25 cc. each of 40 per cent. potassium hydroxide and chloroform; boil gently until one minute after the chloroform has been driven off.

A pink colour develops, usually strongest after standing for five minutes. When doubt exists as to the development of the colour an unboiled control test should be performed.

The sensitivity of this test has been determined a number of times. In distilled water, hexyl-resorcinol can be detected in dilution of 1-100,000; in urine, 1-50,000; in serum, 1-25,000. If a 1-5,000 dilution of hexyl-resorcinol be added to bile, a pink colour can be detected in the foam after the reagents have been boiled. Had significant amounts of hexyl-resorcinol been present in the various body fluids, it could certainly have been detected by this test. It is still possible, however, that the colloids of the serum may transport a considerable amount of the drug in some masked condition.

Results in Pyelitis and Urological Surgery.—

We have had an opportunity to follow the results of hexyl-resorcinol treatment of at least forty patients in the urological service of the Louisville City Hospital. Out of twenty pyelitis cases followed for a period of ten or more weeks,

marked improvement was noted in ten cases which received no other medication. In the other half of the pyelitis cases the results were less clear although improvement was noted in some. The dose used was 0.9 gram in olive oil (capsules) daily. We have not entered into a sufficiently detailed study of the bacteriology in these cases to present a separate report on pyelitis.

Of especial interest, however, is the postoperative condition of wounds which drain the urinary tract. Two days prior to and daily following urological operations, a series of twenty cases was given 0.9 gram of hexyl-resorcinol. With urine draining through suprapubic and external urethrotomy wounds and soaking dressings, granulation tissue was healthy and normal; and though a few *B. coli* were cultured from the urine, no further evidence of infection was observed. Hexyl-resorcinol was easily detected in the urine of these patients.

Summary

1.—Following oral administration to dogs hexyl-resorcinol appears to be absorbed throughout the small intestine.

2.—After therapeutic doses in man, and in dogs receiving one gram per kilo. body weight, hexyl-resorcinol did not appear in any body fluid tested except the urine.

3.—The potassium hydroxide-chloroform test detects hexyl-resorcinol in high dilution (1-50,000 in urine).

4.—Many pyelitis cases are distinctly benefited by hexyl-resorcinol.

5.—Suprapubic and other wounds from urological operations remain clean in spite of contaminated urine after prophylactic oral doses of hexyl-resorcinol.

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ABORTIONS AND THEIR TREATMENT*

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INTRODUCTION

THE subject of abortions appears to have been of absorbing interest from times immemorial. Hippocrates thought the subject of sufficient importance to include it in his famous oath. In one of Plato's dialogues Socrates is made to speak of artificial abortions as common and also allowable. Plato himself refers to the subject in his "Republic." Lysias and Aristotle¹ discussed the legality of induced abortions. For the Romans, the frequency of induced abortions is noted by Ovid. Juvenal, Seneca, Galen and Cicero have all dealt with this topic at one time or other. Quoting from Mussonius, Stobaeus tells us that punishment was inflicted on the woman who caused herself to abort.

In Europe, until the middle-ages, the offense was punishable by death. Sir Mathew Hale, who lived in the seventeenth century, tells us that in England not quite as serious a view was taken of the offense of induced abortions. A hundred years later, Blackstone said that by ancient law induced abortions were considered homicide or manslaughter.

Among primitive savage races infanticide is far more common than abortion. It is less troublesome to kill a child after it is born than while in utero! Abortions are however, quite common among the American Indians; also in China, India, and throughout Asia in general. This in spite of the fact that induced abortions are contrary to the teaching of their several religions as well as against the laws of the land. In Soviet Russia induced abortions are no longer subject to punishment; their reasons as quoted in the *Nation* New York, from the Moscow *Pravda*, are that "punishment does not prevent the woman from undergoing them, but forces hundreds of women to apply to ignorant midwives and other persons for help; as a result, they become ill and often remain injured for the rest of their lives.

Thirty per cent. of the patients in the gynæcological hospitals are women whose illness is due to improperly performed abortions. Because of this condition, the decree declaring abortions unpunishable was passed. Doctors perform the operation in hospitals and the number of after-abortions sicknesses has greatly decreased; moreover, it has become possible to obtain information as to the number of abortions made and to start a campaign against the practice." In Switzerland² induced abortions came very near to being legalized.

Incidence.—The exact figures for the relative proportion of abortions to all pregnancies is rather hard to obtain; the statistics of various authorities differ so widely. Priestley⁴ studied the histories of 400 women—private cases—all of whom had reached the age of forty. Collectively, these women had been pregnant 2,325 times; of these pregnancies 542 terminated as abortions, that is, roughly speaking about 25 per cent.

The Rotunda Hospital of Dublin, gives statistics showing that out of 25,790 maternity cases, only 872 were abortions, a proportion of only about one in thirty. This rather low proportion is probably due to the fact that of these patients the majority utilized the hospital for labour at full term far more often than for their abortions.

The statistics of the European cities⁵ during the last few years show that some 50 per cent of pregnancies terminated as abortions. In Berlin during the time of the war, the percentage is stated to have reached eighty-nine. Freiburg, on the other hand, gives a percentage as low as seven. Bumm¹⁰ claims that from fifteen to thirty cases of beginning abortion come to his clinic daily. He believes that 90 per cent of them are criminal and probably due to hard times. Cosbie⁸ of Toronto, from a study of 281 women with 1,203 pregnancies found 527 abortions, that is, the rather high percentage of forty-three. My own review of 120 cases of abortions that were treated at the St. Boni-

*From a paper read before the Winnipeg Medical Society, December 19, 1924.

face Hospital from January 1, 1921 to October 20, 1923, showed that these women had altogether been pregnant 447 times, of which 165 terminated as abortions, that is, a percentage of about 37. Hence one may conclude that a ratio of about one in four could be regarded as conservative for abortions to all pregnancies.

TREATMENT

Under this heading one has to consider:

- 1.—*Prophylaxis*.
- 2.—What to do to arrest a *threatened abortion*.
- 3.—The treatment of a case of *inevitable abortion*.
 - (a) *The complete abortion*—in this case usually no sepsis takes place.
 - (b) *The incomplete abortion* (i) where no sepsis has occurred; (ii) where sepsis is present.

Burgess¹³ of Montreal subdivides this class still further into (a) *sapraemia*, and (b) *pyogenic infection*.

I.—Under *prophylaxis* such *constitutional* causes as syphilis, tuberculosis and the various *anæmias* should receive appropriate treatment, preferably *before* the woman becomes pregnant. Thyroid dystrophies should be corrected whenever possible. One must carry out or, at least, advise the rectifying of such local predisposing causes as cervical laceration, uterine displacement or any condition that may lead to endometritis.

The so-called *irritable* uterus with its *idopathic abortions* is best treated by insisting that a woman spend at least the first three months of pregnancy at absolute rest in bed. Sexual intercourse must be forbidden. Drastic purgatives and emotional disturbances must be avoided. I can cite one instance in my own experience. Mrs. T., the wife of an editor in a certain small town, had lost her two children from different causes; subsequently during a period of six years she had, I believe, seven abortions without any apparent cause. As she was very anxious to have a child again, she carried out the above régime diligently and gave birth to a full term healthy child. Dr. Alice White¹⁴ of Sheffield, claims that in these cases, giving every night thyroid ext. gr. 1-8 to 1-4 and ovarian ext. gr. v. will improve the

chances of the mother carrying the *fœtus* through to full term.

II.—*The treatment of a threatened abortion*.—Little need be said here. All authorities are quite agreed as to the mode of procedure. The patient is placed in bed at absolute rest and should be kept in bed for at least a week after all signs of hæmorrhage have disappeared. Sedatives in the form of morphine and the bromides are given freely. Hyoseyamine may also be employed. Purgatives are to be avoided. Of the series that I reviewed there were twenty-four cases that were successfully treated; one case could not be arrested. This rather unusually good showing, I would be inclined to attribute to the fact that the provisional diagnoses were most likely recorded after and not before the final diagnoses.

III.—In the case of the *inevitable* but *complete* abortion, there is no indication to do anything with the exception of keeping the patient in bed for at least a week. In addition, two or three grains of ergotin three times a day can do no harm. The only conceivable condition here that might require treatment in an active form, would be a case in which hæmorrhage becomes markedly profuse. Then it would be proper to pack at least the vagina and even the uterus. Also of course one may have to employ proctoclysis, hypodermoclysis and even blood transfusion.

III. (b).—*The treatment of the inevitable incomplete abortion*.—Whether the case is septic or not, where hæmorrhage is severe enough to endanger the patient's life, all authorities as far as I could find, seem to agree that the uterus must be emptied. In cases in which *no sepsis has occurred*, the following advice has been given:—Polak¹⁵, of Brooklyn, considers that this condition is one of the few indications for the use of a curette, especially before eighth week. Berkley and Bonney¹⁶ in their text-book tell us that where sepsis is absent and abortion is incomplete it is quite justifiable to use a blunt flushing curette. Gordon¹⁷, of New York, says that the curette is seldom required in such cases. Hillis¹⁸, of Chicago, after an intensive and exhaustive study of 122 non-septic incomplete cases, believes that curettage should be the routine procedure. In a more recent article¹⁹, he advises a preliminary delay of five days.

In the series that I reviewed, there were

seventy-two cases of incomplete non-septic abortion. Of these the twenty-three that were treated conservatively had to stay in the hospital longer than the forty-nine that were curetted, and from the histories appear to have had a more uncomfortable time of it than those that were treated actively.

Shears²⁰ advises the removal of the contents of the uterus with a gloved finger where the os is dilated enough to permit that to be done. Bladder and rectum are to be emptied first and proper antiseptic cleansing must be carried out as a preliminary. Where cervix will not admit a finger and bleeding is somewhat free, Yates and Connelly²¹, of Detroit, tell us to pack the cervix with iodoform gauze, and the vagina with plain sterile gauze, stating that when these packs are removed twenty-four hours later, the cervix will likely be found open and the products of conception will be expelled from the uterus spontaneously. This method of packing does not appear to be rational, as we are only courting disaster by the possibility of converting a non-septic abortion into one with sepsis. In the small number of cases that I have had to deal with, I have given $\frac{1}{2}$ cc. of pituitary extract and repeated same in twelve hours time.

Dr. Gordon²², of New York, gives $\frac{1}{2}$ cc. every three hours for four or more doses, i.e., at the beginning of the inevitable cases. In some cases this treatment seemed to have been effectual in completing the emptying of the uterus. Where after a delay of twenty-four hours it failed the patient was sent into the hospital and prepared as for a major operation. While the patient is under a general anæsthetic a preliminary dilatation with Fenton's dilators was done in cases in which it appeared to be called for. Then placental forceps were used and that was followed by a gentle scraping with a dull flushing curette. The results appear to have been fully gratifying.

III. (b).—*The treatment of cases in which sepsis has occurred.* (This would really be the same as for septic uterus at full term delivery). All possible precautions must be taken when treating an aseptic case not to convert it into a septic one. The majority of hospitals conclude that septic abortions are, as a rule, criminal in origin. In the series that I reviewed of the twenty-four cases that were septic at least seven admitted criminality. In the others, the cause

of sepsis could not be ascertained. All, or nearly all authorities, agree that where sepsis is present, the patient's best chance is to have the uterus left absolutely alone. Grube²³, a German gynaecologist of note, is one of the few exceptions. He claims that he has been emptying the uterus actively in all septic abortions during twenty years of extensive practice and none of them proved fatal. Henkel²⁴, another prominent German gynaecologist, is very emphatic that treatment of septic abortions must be conservative. The same view is held by far the greater number of prominent gynaecologists throughout the world. Hobbs²⁵, an English authority, claims that the insertion of a terminal-eyed catheter lubricated with glycerine into the uterine cavity proves of distinct benefit by permitting the septic secretions to escape. Polak, of Brooklyn, from a study of several thousand cases, concludes that the conservative treatment is by far the best. Lotzko²⁶, as quoted by Davis, shows that where active treatment was employed in these septic cases, the mortality was fifty per cent higher than where the expectant method was adopted.

The mode of procedure as described by King²⁷, of New Orleans, and Anspach²⁸, of Philadelphia is as follows:—The patient is placed in Fowler's position. Ice bags are applied to lower abdomen. Bowels are kept open with enemata. No cathartics are given. Patient is nourished freely on soft or semi-solid food. Fluids are supplied abundantly by mouth if tolerated; if not, then by proctoclysis, hypodermoclysis or even intravenous saline infusions. Dr. Polak gives in addition to above, 250 cc. of citrated blood every four days. A capsule containing ergotin, quinine sulph. and strychnine is also of some benefit. Antistreptococcic serum is an aid, 30 cc. to be given on each of the first two days and 20 cc. on the third day.

Mercurochrome as advocated by Young and his associates, is claimed to be of assistance. Dr. Chipman, of Montreal, in his recent lecture on septic uterus tells us, if my memory is correct, to be cautious with this drug, as it is as yet in the experimental stage at least as far as its use in obstetrics is concerned. Luker²⁹, of London, claims to have been able to reduce a mortality of 34.2 per cent. in cases of puerperal sepsis to 5.8 per cent. by the use of quinine-bi-hydrochloride. He gives it in doses of 5 gr. to

a 1 cc. sterile solution when used intramuscularly or 3 gr. in 10 cc. when given intravenously. Hence it would appear to be worthy of trial in cases of septic abortion.

After the temperature has been normal for at least five days, Hillis suggests curettement to avoid subsequent chronic endometritis. To others this curettage does not seem necessary nor justifiable.

The series that I studied, showed twenty-four septic cases. This is far too small a number from which to form any conclusions; however, the findings coincided pretty well with those of the statistics from other hospitals. The ten cases that were treated radically had an average stay in the hospital of 13.7 days, almost double that of the fourteen cases that were treated expectantly (7.2 days).

Hillis shows rather conclusively, from a study of 200 cases of septic abortions, half of which were treated conservatively and the other half by intrauterine interference, that the cases with no local treatment had fewer days of fever, a shorter stay in the hospital, and showed a lower mortality.

It will not be out of place to present here the mortality statistics for Canada, not including the Province of Quebec, for 1923. No doubt a number classed as puerperal sepsis originated as abortions.

FATALITIES DURING 1923

Name of Province	Abortions	Abortions with Septicemia	Abortions self Induced	Puerperal Septicemia	Total
N.S.	5	3	..	20	28
N.B.	1	2	..	11	14
Ont.	14	15	9	99	137
Man.	1	7	2	22	32
Sask.	8	3	1	44	56
Alta.	6	7	4	22	39
B.C.	4	5	1	18	28
Totals ...	39	42	17	236	334

Footnote: These figures were supplied by Mr. E. S. McPhail of the Dominion Bureau of Statistics at Ottawa.

A review of cases of abortion treated at the St. Boniface Hospital, during the period from January 1, 1921 to October 20, 1923.

(a) The total number of cases was 120.

(b) There were no mortalities; there have been a number since the above date.

(c) Of the twenty-five cases that came in as threatened abortions twenty-four were successfully treated; one could not be arrested.

(d) The 120 cases studied had altogether been pregnant 447 times; of these 165 terminated as abortions, i.e. approximately 37 per cent.

(e) Seven of the cases admitted criminal intent. In sixty cases, the histories did not reveal the cause. A few of the cases in which a possible cause was given are interesting from the standpoint of etiology:—One, extraction of a tooth; one, diabetes; one, toxic goitre; one, doctor's examination; one, syphilis—this was the only case where a Wassermann was carried out, and the test proved positive. It is unfortunate that in none of the other cases was there a record of a Wassermann test having been taken, although there were cases with histories of more than five abortions. It is possible that the Wassermann test may have been carried out outside of the hospital.

(f) Of the ninety-six cases that proved inevitable, twenty-four came with a septic temperature. Of these ten were treated radically, that is, with intrauterine manipulation. Their average stay in the hospital was 13.7 days. The fourteen cases that were treated conservatively, the average stay in the hospital was 7.2 days.

(g) Of the septic cases, seven admitted criminality. Conversely all the cases that admitted criminal intent proved septic.

(h) Of the non-septic cases, the twenty-three that were treated conservatively, i.e. were not curetted, had an average stay in the hospital of seven and a half days. The forty-nine cases that were curetted had an average stay in the hospital of six and a half days.

Conclusions

From the findings of the St. Boniface series, as well as from the review of the literature and text-books, the following conclusions appear justifiable:—

I.—In the non-septic abortion case that remains incomplete after twenty-four hours of expectant treatment, active emptying of uterus by curettage is indicated.

II.—In the complete septic abortion, best results can be expected where only conservative measures are employed.

III.—Abortions occur altogether too frequently; they constitute at least 25 per cent. of all pregnancies. No one can deny that they result in an unjustifiable loss physically, economically and perhaps, even morally, to say nothing of the fatalities. Therefore, it is up to us as medical men to combat this malady by all means at our command.

One would suggest:—First, by carrying out

wherever possible all the proper prophylactic measures to overcome predisposing causes *before* as well as *during* the time that the woman is pregnant, and second, by showing more emphatically than has been done hitherto, that the unnecessary abortion does not meet with our approval.

I wish to express my gratitude to (1) Sister Rodzier of the record's department of the St. Boniface Hospital for the assistance in collecting the histories; (2) the library staff of the Medical Faculty of the University of Manitoba; (3) Mr. E. S. MacPhail, of the Dominion Bureau of Statistics, and (4) Miss Hill of Dr. McMillan's office, for the preparation of the lantern slide.

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MODERN ADVANCES IN DIAGNOSIS (OF TUBERCULOSIS)*

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THE tubercle bacillus after penetrating the human host strives to successfully invade and establish its lesions as widely as possible. The type and extent of the involvement which may be present at the time the patient presents himself for examination (or should have done so) usually represents the result of a series of interrupted victories, and is not the outcome of one continued and evenly graded advance. This hindered type of invasion is frequently well illustrated by the clinical history; had we adequate biological methods, the resulting graph would probably show this in a more convincing manner.

Spontaneous recovery may in many instances take place even after the amount of tuberculous involvement is surprisingly large in extent. An ideal diagnosis then would be the detection of the presence of a tuberculous lesion before the host had lost to any serious extent the ability

of spontaneous recovery—that is, during that indefinite stage which exists between tuberculosis as an infection and a disease. Failing this the diagnosis should be made while the lesion is in its incipient stages—early as regards duration, and small as regards extent. Opie¹ states that “the distinction between latent and clinical tuberculosis has no other basis than the limitations of diagnostic methods and the tendency of tuberculosis to proceed to recovery.”

Our methods are unfortunately too crude to do this always correctly, but frequently opportunities are afforded us to approximate the ideal diagnosis by keeping under observation those individuals whom we know are or have recently been exposed. In this connection it is my opinion that we have, in stressing the importance of childhood infection, overlooked the importance of contact in adult life. While there can be no doubt that infection in early life alters the character of the disease appearing clinically in adult life, this does not necessarily mean that the adult disease is due to the same strain which

*Given before the twenty-fifth Annual Meeting of the Canadian Tuberculosis Association, Montreal, Que., May, 1925.

was implanted in childhood, i.e., an endogenous re-infection. In other words, bacilli received from without in adult life may be the strain to successfully invade and form the lesions of chronic pulmonary tuberculosis; and this in my opinion is not an infrequent occurrence.

When I was asked to give an eight-minute paper on modern advances in diagnosis, I felt it more consistent with the title to deal, even though briefly, with all our methods, rather than concentrate on any one, particularly as there is no one method of value which is recent, unless one wishes to regard modifications in radiological technique† in this light.

Though no one of the methods one may be accustomed to use in making one's diagnosis should be evaluated apart from the others, yet the history and the physical examination stand in particularly close relationship to one another. To a large extent the correct interpretation of the physical findings and observations made on examination is dependent upon the past and present history. This history, together with the physician's estimate of the patient's general condition and true symptoms is as valuable as one chooses, or is able to make it. Possibly the shortest example I can give is an extensive tuberculous involvement which in one patient is associated with a long drawn-out history, and the presence of marked emphysema, and in another a short history and findings uncomplicated by the presence of emphysema.

These two methods constitute the foundation of differential diagnosis. So important is this that it is difficult to mention it without enlarging on it beyond the time limits of these remarks. I would dismiss it by saying that whether tuberculosis is included or excluded in one's diagnosis, the patient's symptoms, present general state of health, and past history, should be adequately explained by the diagnosis. This is however, in my experience, not always possible.

Not infrequently other pathological conditions may exist coincidentally with a tuberculous lesion and this latter may be playing either the major, minor, or a negligible part in the health of the patient. Some reflection upon the list that the pathologist piles up as his anatomical

diagnosis *post mortem* would seem to illustrate my meaning.

The other methods one uses should be correlated with, but made to subserve, the information obtained by means of the history and the examination. On grounds of popularity—and deservedly so because of its intrinsic value—the use of the stereogram may conveniently come next. From several points of view the modern diagnostic exploration of the chest is not complete without a well taken stereogram. The use of the fluoroscope has its value and advantages but it can not take the place of the permanent record and information afforded by the stereoscopic plates.

The interpretation which one makes of a stereogram is so important that the clinician should aim to do this; he cannot without considerable experience and teaching. A true tuberculous lesion almost invariably throws characteristic shadows whether these are extensive, or confined and small in extent. With experience to guide one the tuberculous etiology of these shadows can be given as a fact. With other shadows, not characteristic and possibly more or less gross in extent, one's interpretation etiologically can only be regarded as an opinion. Yet again shadows may be present, indistinguishable from what is a fair average for normal individuals, and the existence of tuberculosis only proved by the presence of bacilli in the sputum. Usually such shadows are described as "peribronchial." The term is I think legitimate through usage; a definite etiological interpretation is what is at fault.

Before this audience I feel it is unnecessary to do more than mention the value of the examination of the sputum—or rather, the repeated examination. Often the positive result will be of importance later because of its chronological value. The diagnostic value of persistent negative findings varies with the individual case.

The diagnostic use of tuberculin except in childhood is in my opinion rarely of value. Occasionally, in a selected adult the induction of a general reaction to 10 mg. of tuberculin or less may help sway one's final diagnosis.

The use of serological tests I believe to be of equal value with any of the methods mentioned, provided one fully realizes their limitations. This will only be appreciated if they are used serially—that is, as a routine at each, or at least

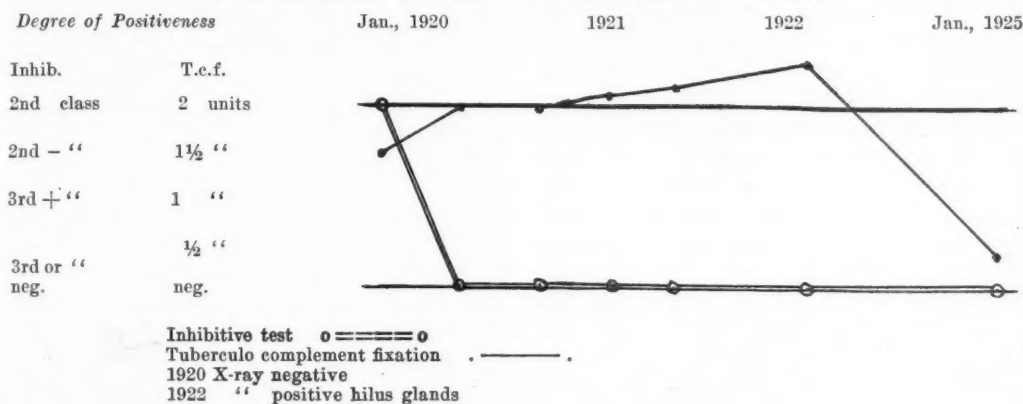
†A quite recent and apparently valuable modification has been introduced by Dr. Maurice McPhedran at The Phipps Institute, Philadelphia. (Personal communication by Dr. D. A. Stewart.)

most, of the re-examinations. They give information that can not be obtained by any other method. Those of my colleagues in Toronto who do this are in full accord with me as to their value. The two tests which we use are the inhibitive and the complement fixation tests. Valuable as they are, they should be correlated with the full examination and do not constitute a "short cut" laboratory diagnosis.

ter, three and four were employed, instead of no examination and a tonic, the initial diagnosis would not be made on the advanced (probably hopeless) lesion as is still so frequently the case.

May I conclude by giving an example of the value of serial serological tests. My colleague, Dr. W. E. Ogden, and myself have kept under more or less continuous observation considerably over 100 contacts with open cases.

SERIAL SEROLOGICAL FINDINGS IN A CONTACT AGED TWELVE (1919)



I have just mentioned the word re-examination; in a manner of speaking the idea of re-examination is one of the most important features of the modern diagnosis of tuberculosis, whether this is clinically pulmonary tuberculosis or tuberculosis of some other system or tissue.

May I illustrate my meaning by quoting Lawrason Brown², who says that the diagnosis of pulmonary tuberculosis is not complete with the determination only of the presence of the disease, but must include also opinions about its activity, stage, place and length of treatment. I would prefer to add that the diagnosis should express an opinion as to the extent of the damage already sustained by the natural tendency to recovery.

Diagnosis viewed in this respect includes to some extent prognosis. It can not be satisfactorily achieved by the single examination; observation and re-examination are almost essential. When complete it is based upon the data methodically obtained by these more or less standard methods. If only the first two, or bet-

ter, three and four were employed, instead of no examination and a tonic, the initial diagnosis would not be made on the advanced (probably hopeless) lesion as is still so frequently the case. The 42.8 per cent we regard as indicative of a "take." This particular case is chosen because it is the longest under observation, the stereograms were obtained at fairly fortunate periods, and the entire chart we believe not only illustrates the value of serial serological findings but throws some light on "latent" lesions. The boy was in a preventorium for a few months in 1920, since when he has had no treatment beyond some prolongation of his holidays taken after the test and x-ray in 1922. He has worked at some job continuously and has apparently enjoyed normal health and growth.

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TUBERCULOSIS IN THE CHILD. PREVENTIVE RÔLE OF THE OPEN AIR SCHOOL, THE SUMMER CAMP, THE PREVENTORIUM*

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SIR JAMES BARRIE when recently addressing a girls' school in England said, "I should like to give you a motto, something to strive for. I should like to see blazoned over the entrance to your school the words 'Every child born into the British Empire should get an equal chance.' " Is it not a motto for which every community should strive. Should not every child, our future men and women, have an equal chance. Citizens of one of the world's great republics take pride in proclaiming as one of their foundation beliefs "all men are born free and equal." Politically this may be true, but from the medical and sociological point of view we know that many are born with serious physical handicaps.

If the State has any ideals at all, one must surely be that it is the duty of the State to lessen, as far as in it lies, the burden or handicap handed down to the child who suffers through no fault of his own. But apart from any physical handicap, the child has to suffer the handicap imposed by our present civilization, that of preventable infection and disease. This afternoon we are discussing the subject of tuberculosis and tuberculous infection. Children are not born with tuberculosis. Tuberculosis is a postnatal infection. The innocent child becomes the victim of disease spread by a human being or by cattle suffering from tuberculosis.

We know to-day that during the years of school life a large proportion of our children become the hosts of the tubercle bacillus. In the crowded cities we know that as many as 75 per cent. have become infected by the age of fifteen. In a recent survey of a town in Ontario with little foreign population we found that by the age of fifteen 47 per cent. of the children reacted to tuberculin. In the adjoining rural population, 27 per cent. of the children at

same age showed infection. These infected children form the population from which the adult cases of consumption develop. The large majority if not all of the cases of pulmonary tuberculosis being treated in our hospitals and sanatoriums received their initial infection before the age of sixteen. Possibly one half of these received a further infection from another source in adult life, which actually determined the onset of their disease. In the others, their pulmonary tuberculosis was due to a gradual or periodic spread within the body of this infection received in childhood. If we can control or lessen severe childhood infections, we believe we can go far towards preventing adult tuberculosis.

We have convincing evidence that children who become infected with tubercle during the first eighteen months of life show little resistance and that a large proportion of them die from tuberculosis. After this age, there is gradually developed in the tissues and cells of the child an ability to combat infection. This process we call immunity. With each succeeding year the child appears to have an increasing immunity to tuberculous infection and the degrees of success or failure would seem to be dependent upon two main factors; the quantity, whether minimal or maximal, of the infecting agent received into the system, and as well the frequency with which this infecting agent is received; also the degree of normal health possessed by the child. This latter may be a factor at the time of infection, at the time of re-infection, or at any time during the period he is the host of his infection.

To express this in other words, we believe that children exposed to tuberculosis—that is to say, those children who live in intimate contact with a case of consumption or who drink unpasteurized milk from tuberculous cattle, fre

*Read at the Annual Meeting of the Canadian Tuberculosis Association at Montreal, May 15, 1925.

quently become infected. These children may be placed in three classes.

1.—Those who develop a marked degree of immunity and who remain in good health.

2.—Those whose infection is severe or whose immunity is slight and who develop an active tuberculosis which may affect almost any organ or tissue of the body.

3.—A class between these extremes, who develop infection which is resisted to some extent, but imperfectly, resulting in a degree of ill health which may be, (a) a debility without definite evidence of disease, or (b) a mild chronic infection, slowly progressive, or latent over long periods with intervening periods of activity and spread of disease within the system.

It is for this latter class of children that special provision is desirable. For such children there is required periodic opportunity for increasing resistance to infection through improvement in general health, and opportunity to leave the infected environment when massive infection is possible or even probable. Where do we find these children? I shall point out a few sources. There is the child in the household of the careless consumptive, constantly exposed to massive infection. There is the child in the house of the very sick mother who may be reasonably careful, but is too ill to observe necessary precautions. There is the anæmic and undernourished child who may be exposed to repeated, even infrequent, infection from a reasonably careful patient.

In our system of school inspection, we find the undernourished child who reacts to tuberculin and whose home conditions are not such as to lead us to expect improvement in his general health. A child below par physically, already infected or exposed to infection and not receiving proper care is almost certain to develop active tuberculosis. We do not want to wait until clinical tuberculosis can be diagnosed. We require the preventorium to give the child the benefit of that treatment which we know frequently leads to cure in active cases of tuberculosis.

Doctors, nurses and social workers are constantly finding in the crowded homes of tuberculous patients in the poorer quarters of our cities, children who are in constant peril of infection. It is impossible to safeguard such children by any measures which can be undertaken in or for the homes, and hence the need

for institutions where for a time they can be entirely removed from infection and their resistance built up.

Holbrook has made use of Arthur Stringer's words "not only is the child the father of the man, but about everything worth while happens to you—with the exception of course of your wedding and your funeral—before you are fourteen years of age. These fourteen years are the years that count, are the years that put the waffle-iron ridges in your character, and make you either a plumber with a weakness for porterhouse steak or merely a college professor with a watery approval of enforced vegetarianism. Every moment is formative, every act is natural, and every adventure is an influence for good or evil. The gun is loaded and what you may bring down when you are forty or fifty is determined by what you've loaded it with when you were five or ten." It is generally acknowledged to-day that fully one-half of the cases of adult tuberculosis, are dependent upon an infection received in childhood, and the child's future depends much upon how his infection is treated. A successful combat with his infection may lead to a very definite development of an immunity which is of service against subsequent infections.

The child in the environment of the preventorium may turn his misfortune into an asset by building up a strong resistance. While the child untreated or allowed to continue in unsanitary surroundings and remaining underweight through improper or insufficient diet and rest and sleep, may continue with an infection which smoulders on until he breaks down with an adult tuberculosis.

How are we to protect the child? Dr. Otis tells us, "If the mother has open tuberculosis, the isolation of the child is the only safe course," and again, "Especial attention should be given to increasing its resistance by general good hygiene," "It is of the greatest importance that the young child should be protected from all sources of infection, whether it be the milk of a tuberculous cow or from a tuberculous individual in the home. Its strength should be carefully conserved during the convalescence from measles and whooping cough, which diseases render the child peculiarly susceptible to tuberculous infection. Later in childhood, when resistance to tuberculous infection or the extension

of an already existing infection, is well established, the child should be given such general care in regard to fresh air, food, rest, bathing, etc., as will secure and maintain a high standard of health."

Day camps, forest schools, open air schools, the open window room, with extra diet and mid-day rest offer all that may be necessary in the case of the anæmic or undernourished child, even if he is a tuberculin reactor, provided he is not exposed to infection in the home. Many of such are unfortunately found not to gain as they should because of the difficulty in correcting the unhygienic condition of the home in which the child spends his evening and his night. In our northern climate, specially constructed open-air schools and the open window school may be carried on throughout the year, but the day camp, and the forest school are practicable only from May to October.

In Toronto, the Hospital for Sick Children has a Lakeside Home operated during the summer months. Here for some years the Heather Club Chapter of the Daughters of the Empire carried on a pavilion for tuberculous and contact children, but as the work grew the need for a winter home became increasingly evident and the Chapter appealed to the President of the Order, Mrs. A. E. Gooderham, for suggestions as to how the need might be met. Colonel and Mrs. Gooderham became much interested and speedily purchased, remodelled, and equipped a beautiful home on the outskirts of the city which became the nucleus of the preventorium. It was handed over to the Board of Directors with the provision that when an endowment fund of \$60,000 was completed, the preventorium was to become the property of the Imperial Order of the Daughters of the Empire in Toronto, to be used in perpetuity for child welfare.

The institution has steadily grown and further additions and improvements are still contemplated. Beside the original building it now comprises an infirmary for infectious cases, an open air school, a playhouse and gymnasium, a babies' pavilion, a nurses' residence and a laundry building. In the school room classes are conducted by the Board of Education and vocational work as developed in our military hospitals has been introduced to the children with great satisfaction. The following is quoted from a recent newspaper article written by a de-

lighted visitor. "The preventorium has been of such inestimable value that the Board in charge has been obliged to extend and enlarge far beyond the original plans, and now there is an institution upon which nearly a quarter of a million dollars has been expended. Each time the Board has arrived at the stage where the endowment fund, with which they had hoped to render the future of the preventorium secure was in sight, an extension of the work has depleted the fund."

I shall have an opportunity to describe the preventorium when showing you the series of lantern slides. I wish that more of the good people of Canada could see a preventorium. If you want to do any city or town a good turn send a prominent citizen on some pretext to visit a preventorium. That good old advertising legend will then apply, "He won't be happy till he gets it."

Now a word as to the possibilities of organized effort in the control of tuberculosis. The Framingham demonstration has shown what can be accomplished in a short time by intensive effort. Similar results may be achieved in any community without undue expenditure of public funds. Our experience in Toronto amply confirms this. We have an active energetic health officer who has surrounded himself by a capable staff of assistants at the head of the various divisions of the service. Dr. Hastings has preached for years that public health is a purchasable commodity, that with a well organized service the death rate may be lowered in proportion to the public funds reasonably expended for the combat of such infections as tuberculosis. Advantage is taken of the institutions for treatment provided by voluntary associations and of the aid rendered by auxiliary societies for social work. We have no municipal or state hospital or sanatoriums. Those used are aided by the city. The various activities are coordinated by the health department not by an anti-tuberculosis association. Co-operation is the watchword, with the health department as a liaison officer to prevent overlapping.

There are sanatoria and hospitals for early cases, and for advanced cases, hospitals for tuberculous children, preventoria, open air and forest schools for those not clinically tuberculous, clinics for diagnosis, treatment or other disposition of cases, visiting nurses for supervision and follow up, a system of compulsory

notification which is the start of a search for contacts and sources, associations of clinics to secure uniformity and avoid duplication of work, auxiliary associations to aid the poor in their homes and provide for families in which the bread winner is ill, with other agencies for the discovery, control, and prevention of the disease. In 1900 Toronto's death rate was over 250 per 100,000. Now with a population of 600,000 its rate is sixty-five per 100,000, the lowest death rate of any of the larger cities in America.

A preventorium once established becomes a source of local interest and pride. A great sense of satisfaction is expressed in the reports of all such institutions, while the appeal they make to the hearts of all who visit them make the task of the finance committee much easier than in the average institution. Nothing appeals more

to the human heart than a sickly or poorly nourished child who is not getting a fair chance in the world.

Allen Krause has said that the prevention of adult tuberculosis which quasi-therapeutic institutions like the open air school, or schools adapted to the peculiar needs of delicate children, can do is incalculable; they will repay any amount of development. The conclusion is inescapable that thousands will carry precept and practice even though imperfectly, through childhood into later life, and will translate into action and habit, health practices which on occasion will turn the scale in favour of continued and permanent inactivity of long standing infection. The preventorium, the permanent day and night camp, the open window school room, the open air and forest schools offer the child this opportunity.

THE MOST IMPORTANT AGENCIES IN A PROVINCIAL CAMPAIGN AGAINST TUBERCULOSIS

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FOLLOWING the discovery of tubercle bacilli, in 1882, Koch stated that the important agencies in combating the disease were: (1) Compulsory registration; (2) compulsory disinfection; (3) segregation. These measures directed against the germ of infection have, during the past four decades, been supplemented by indirect measures calculated to remove the causes that develop infection into disease, and the method of compulsion has given way almost entirely to education.

Needless to say the importance of various agencies vary according to the stage that the campaign has reached in any province. So, too, agencies must vary accordingly to the density and occupation of the people. Indeed no two localities could be found where various anti-tuberculosis agencies have equal importance.

Public Health Agencies.—Of the very first importance in a provincial tuberculosis campaign is the work of the various public health agencies.

By such caption I mean to include all public or community health agencies engaged in fostering positive health or endeavouring to reduce the general death rate.

The epidemiological studies of Brownlee in Great Britain extending back as far as vital statistics are available show that, taking England as a whole, the tuberculosis death rate has varied with the general death rate. It has frequently been elsewhere observed that tuberculosis becomes a minor cause of death in immunized communities in proportion to the healthiness of the people. Undoubtedly the low tuberculosis death rate in Saskatchewan for the past ten years, varying around forty per 100,000, has been in no small degree influenced by the low general death rate in that province.

Apart from lowering the general death rate itself, of equal importance in a campaign against tuberculosis, is the reduction in the number of susceptible persons in the community. Weak-

lings fall to tuberculosis in young adult life, the age of maximum fatal susceptibility for this class being between twenty and thirty.

There are several important public health movements concerned in the reduction of the number of susceptible children, thus preventing breakdowns in the young adult life. Some of these are:

- (1) Prenatal care and education of the parents.
- (2) Curfew educational campaigns — more rest—more sleep.
- (3) Fresh air and sunlight campaigns, playgrounds, summer camps, etc.
- (4) Nutritional education; more milk, green vegetables and plain food.
- (5) Improvement of housing conditions by sanitary regulations controlling light, ventilation and sleeping accommodation.
- (6) Health education of children in the schools.
- (7) Medical examination and correction of debilitating defects in school children.

Of all the efforts being made to-day to foster positive health, the health education of school children, and medical examination for the purpose of detecting and correcting debilitating conditions will undoubtedly have the most far-reaching effects so far as the prevention of tuberculosis is concerned.

Life and Health Insurance Companies and Employers of Labour.—Another group of agencies which have recently taken an active part in anti-tuberculosis work and which are destined to play an important rôle in prevention of tuberculosis among adults are certain financial agencies—insurance companies and large employers of labour—primarily interested in prolongation of life and prevention of loss of time through illness.

Periodical examination of employees has been undertaken by many corporations and employers of labour. Several life insurance companies in America have recently engaged the Life Extension Institute to undertake periodical examination of their policy holders. Group insurance of employees has increased by leaps and bounds, and the motive of economic advantage promises to reform bad working conditions and hazardous employment. This remarkable effort in prevention will result not only in early diagnosis of the disease but in many debilitating conditions which predispose to tuberculosis being removed.

Laws have been passed by the governments, with the object of reducing the hazard of predisposing occupations, such as laws regarding silicosis in South Africa, and workmen's compensation acts have been put into effect in most provinces.

Anti-tuberculosis workers have found in group insurance companies, employers of labour and trade unions, an Atlas who promises to lift from their shoulders the great burden of predisposing occupations.

Medical Colleges and Preventive Medicine.—Medical schools with their ever-rising standards are doing much to advance preventive medicine. There has been within the past ten years marked improvement in the teaching given in regard to tuberculosis in our colleges. Some schools have introduced a chair in tuberculosis; others have arranged for a special series of lectures by recognized authorities.

In view of the close direct relation between general death rate and tuberculosis death rate the responsibility of schools in anti-tuberculosis work is to stress even more public health in general so as to prepare their graduates for leadership in public health efforts in the community. In the absence of a specific, preventive medicine is, after all, the strongest known weapon against tuberculosis. The emphasis given to surgery in medical schools during the last generation was necessary to introduce the aseptic method as a preventive measure. The recent advances of preventive medicine and hygiene have earned for it a major place in medical science. Medical schools might now, in the interest of the public health, feature honours in public health and let post-graduate medicine take care of non-emergency operative surgery. Manitoba deserves credit for relegating non-emergency operative surgery to a post-graduate status, while Dalhousie has led in undergraduate instruction by introducing a clinical as well as theoretical course in public health.

The wisdom of this is manifest when we consider that approximately fifty per cent. of the physicians in the prairie provinces are health officers of some municipality, and this is also true in a lesser degree in Eastern Canada. The curricula of the medical schools should be adjusted so as to develop a community as well as an individual outlook. The scientific advances in preventive medicine, in past generations, necessitate that doctors be more adequately

trained for their community responsibility and for leadership in health education and prevention.

The Sanatorium as an Educational Centre.—In a campaign against a disease without a specific cure, which, as experience has shown, can be combated chiefly by education, the sanatorium as a special educational centre is of paramount importance. In fact, considering the small percentage of tuberculous persons treated in institutions in Canada the sanatorium can be little more than a demonstrational educational centre.

The sanatorium is the natural educational centre of the anti-tuberculosis movement. There, treatment is being steadily improved and the curability of the disease even in severe forms is being demonstrated day by day, year after year. It is a centre where patients will receive an intensive education regarding the nature of a serious disease and the way of life necessary to overcome it, where they will acquire the hygienic habits necessary to stop its spread. It is a medical centre where in a few months a physician may gain such a familiarity with the tuberculous type and its infinite variety by seeing several hundred cases in rapid succession as he would only gain in a score of years of general practice.

It is an investigation centre where the epidemiological facts regarding this disease for each province may be accumulated and their significance interpreted for the guidance of anti-tuberculosis work. The sanatorium's greatest function will be performed if in addition to treatment it is employed as a centre for investigation, demonstration and education.

I am not forgetful of the need of institutions for treatment. Recently in Saskatchewan a sanatorium opened at Saskatoon, with accommodation for one hundred and twenty-five patients, was filled in less than a month from date of opening and although the tuberculosis death rate in that province is low still more accommodation is necessary to take care of cases needing institutional treatment.

Our sanatoria are well equipped and splendid institutions, and the results secured by treatment in the class of patients admitted are excellent. But what are the few among so many? Although to-day known to be inadequate it has in the past been recognized as a minimum that there should be at least one sanatorium bed for each death from tuberculosis in any community

or province. The general hospitals provide some accommodation so that two cases for each death may be treated annually in one sanatorium bed with some assistance from the hospitals. In addition to the two cases thus treated seven other cases have been found to exist for each death. Investigation of conditions in Saskatchewan in 1921 showed that four of the remaining seven cases were under the care of family physicians. These figures show that given one sanatorium bed for each death it will be found that for every case treated in institutions two are being treated at home. The physician is treating the greater part and, at that, the most helpful portion of the cases. The results of treatment in any province, then, even where the minimal proportion of sanatorium beds has been provided, depend to a great extent upon the efficiency of the home treatment given by the family physician. In those provinces of Canada where reasonable sanatorium accommodation has been provided for cases requiring institutional treatment the next and logical move would appear to be to focus attention on home treatment by family physicians and endeavour to improve it in the future just as institutional treatment has been improved in the past.

Family Physicians in Prevention and Early Diagnosis.—To the family physicians are entrusted the opportunities of prevention and early diagnosis. They are familiar with the family history, environment and personal habits of over-work or dissipation of the majority of our people. They alone are in a position to give dietary advice to the under-nourished, holiday advice to the exhausted, recreational advice to the over-ambitious, and fatherly advice to those who are slaves to social pursuits. They can speak with authority to our tuberculous sick regarding the danger of spreading tuberculosis and tell them how to live so as not to endanger others. The physician stands at the portals of entry to life; he is guide through all the dangerous passes of lowered resistance; he has knowledge of the first opportunities of prevention.

In a word, the medical profession forms the potential body in the anti-tuberculosis movement. This potential body can only adequately attack the problem if medical colleges will develop among their graduates the public health attitude toward the prevention of disease and the lower-

ing of the general death rate, and, if anti-tuberculosis organizations will employ their sanatoria fully as teaching centres. The Manitoba Sanatorium has shown the way. It is stimulating interest among all the medical graduates of that province. This year Saskatchewan is providing for eight internships in its sanatoria and will endeavour in future to offer opportunity and tuition to any physicians practicing in Saskatchewan who wish to avail themselves of the same.

Travelling Consultants.—Travelling chest consultants visiting family physicians at intervals and assisting them with their diagnostic and treatment problems will not only assist in earlier diagnosis but should help to stimulate interest in tuberculosis work and improve the standard of home treatment.

Follow-up Work.—Follow-up work carried on by anti-tuberculosis organizations through family physicians will not only assist the patient but will stimulate interest among the physicians in the after-care of the tuberculous.

Tuberculosis Clinics, Dispensaries, and Nursing Agencies.—Tuberculosis clinics, dispensaries and nursing agencies are gradually being established at strategic points in the various provinces. These are essentially centralized community efforts and are adapted to work in cities and large towns. These agencies are of the utmost importance for community application, but individual application of prevention and early treatment rests with the family physician. I believe the greatest progress in the future will come through the efforts of the family physician.

Nurse.—The nurse, too, occupies a strategic position in anti-tuberculosis work. At present, unfortunately, the graduate nurses of general hospitals know merely enough of tuberculosis to be mortally afraid of it and to want to keep away from it. The principal results emanating from the instruction of these schools is phthisophobia. A few months' experience in a sanatorium would dissipate this traditional fear.

Of first importance is the development of post-graduate courses for nurses in sanatoria. More than fifty nurses could be given such instruction yearly in the sanatoria of Saskatchewan alone. When phthisophobia has been displaced by knowledge of the disease and conviction that it is preventable and curable the education may then be extended to the larger num-

ber of nurses through affiliation of sanatoria with nurses' training schools.

Education of the Public.—If people in immunized communities consult their physicians only when they have fallen sick with tuberculosis three out of four will then have reached the advanced stage. The problem in anti-tuberculosis work to-day is how to get the unwell to consult their physician before the breakdown. Periodical examination of school children will help in the earlier years. Periodical examination of employees and insured adults will bring many more early cases to light and prevent breakdown. The campaign by health workers to induce people to consult their family physicians for an annual medical examination for preventive purposes, goes to the root of the problem and promises eventually to break down the reticence of the physician who waits to be consulted and demonstrates to the people the possibilities of prevention of disease, hurrying the day when prevention will take precedence over cure in the minds not only of the physicians but of the laity.

But apart from education in hygiene and prevention of disease in general the public must be informed regarding the nature of tuberculosis. The modes of infection, the causes that develop infection into disease, and the first symptoms of the disease must be widely taught. The people must know the effect that environment and habits have upon tuberculosis and how unhealthy occupations, bad home conditions, and debilitating infections predispose to this disease.

In every field the press is anxious to open its columns to any health news of public interest or to assist any cause for the relief of suffering. No single force to date has contributed more voluntary assistance in anti-tuberculosis work than has the press. Information must be given regarding happenings of public interest or you muzzle the press.

Personal interviews with responsible persons, and addresses to public bodies, though time-consuming, have the advantage of personal touch. Governments, municipalities, school teachers, women's organizations, and service clubs must be educated and kept informed.

Much information can be disseminated by the cinema. People would rather observe than read. The possibilities of distributing information in this way are legion.

Ultimately we shall depend largely for an in-

formed public on health teaching in schools and towards this end we should steadfastly work. Children must be taught hygienic habits in the schools to-day so that in the next generation

hygienic habits will be observed by parents in their homes. The home will eventually be the centre of health teaching. To-day it is the centre of tuberculous infection.

A CASE OF ADOLESCENT MYXŒDEMA, ACCOMPANIED BY NEPHROSIS AND BY TETANY OF PARATHYROID ORIGIN, TREATED WITH THYROID AND COLLIP'S PARATHYROID EXTRACT*

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INTRODUCTION.—This case, Miss M., now aged seventeen, is the second case reported in the June number of this *Journal*, page 598. In the previous report, it was stated that this adolescent girl developed in December, 1922, a marked œdema, followed, in January, 1923, by convulsions, there being some remission of both during the summer of 1923, recurrence in the following winter, slighter remission in the summer of 1924, and marked recurrence in November as a result of which she was admitted to the Winnipeg General Hospital and came under my care.

It was also shown that the condition was one of myxœdema, complicated by nephrosis of sub-thyroid origin, and tetany of subparathyroid origin, the blood calcium being definitely low. Under thyroid and calcium chloride administration the symptoms of myxœdema almost disappeared, and the convulsions markedly diminished in number and severity.

In January last Dr. J. B. Collip, of the University of Alberta, was kind enough to furnish me with some of his extract of ox-parathyroid, shown to be potent in relieving the tetany of parathyroidectomised dogs and in increasing the blood calcium in such dogs and also in normal animals. This paper gives an account of the results with this patient of combined administration of desiccated thyroid by mouth, and Collip's parathyroid extract by subcutaneous injection.

Progress Following Treatment.—Up to January 28th, the patient had been receiving thyroid (Frosst tablet, 0.2 per cent, iodine), two grains three times a day, and calcium chloride five grains six times a day, with a balanced full diet including plenty of milk and fresh fruit. Commencing on this date, the thyroid dose was continued unaltered, calcium chloride was discontinued, the diet was continued unaltered, and Collip's extract injected daily, the dose being adjusted until the blood serum calcium remained constant between 10.9 and 11.5 mg. per 100 cc. The necessary dose for this was found to be at this period 2 to 4 cc. of the extract per day. On this treatment œdema completely disappeared and the convulsions were controlled almost completely.

The treatment and dosage were, however, complicated by the patient's extraordinary susceptibility to intercurrent infections. On January 30th she developed influenza complicated by otitis media. Recovery was scarcely completed before, on February 13th, she developed a rubella rash with enlarged cervical glands which persisted for three days. Treatment was then uncomplicated until March 1st, when diphtheria developed. The treatment was continued throughout the diphtheria period and recovery from that was complete by March 13th. Treatment was then uncomplicated for a fortnight. On April 1st, with thyroid dose as above, and daily parathyroid injections of 2 cc. she was

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FIG. 1

then free from myxœdema, and œdema, and no convulsions had occurred since March 24th.

Her parents were so satisfied with her apparent recovery that they insisted on taking her home into the country, over 100 miles from Winnipeg. By so doing they have carried out a scientific experiment of great value, which the physician dare not undertake, since, removed from close supervision, and again developing an infection, she reverted to a more extreme stage of her original condition, and, when brought back to Winnipeg in a very critical condition on May 19th, was by the same thyroid and parathyroid treatment again restored to apparent normality within fourteen days of readmission to the general hospital.

When she left hospital on April 1st, her parents were supplied with the necessary thyroid and Collip's extract for several weeks' treatment, and given instructions as to use. On two grains of desiccated thyroid gland three times a day and 1 cc. Collip's parathyroid extract daily† throughout this period her condition continued good, her mentality seemed to be improving and there were no marked nephritic symptoms, though perhaps slightly increasing œdema. During her absence from hospital only three tetany convulsions were recorded. On May 13th she developed influenza with a severe cough and from then onwards her condition changed rapidly for the worse. Œdema developed involving the face, legs and abdomen. The local doctor inserted Southey's tubes in the legs and tapped the abdomen. These procedures afforded temporary relief, but, no real improvement occurring, she was brought back to Winnipeg on May 19th and re-admitted.

†The dose of Collip's extract was reduced to 1 cc. as a safety measure, as it was expected that she would only be kept from hospital for a fortnight.

Condition on Re-admission. — Temperature 101.6° F., pulse 135, respiration 25. She was dull, mentally listless, and coughed frequently, but apparently had hardly sufficient strength to raise the sputum. There was a condition of œdema involving every part of the body. The eyelids were so swollen that the eyeballs were scarcely visible, the abdomen protuberant and full of fluid, the legs and even the arms twice their natural size. The heart sounds were rapid, but strong and clear. Many râles could be heard over both lungs.



FIG. 2

Progress and Treatment.—For the next few days her temperature fluctuated between 101° and 103° F., and then slowly fell; the pulse showed similar changes. The basal metabolic rate on the 21st was minus 5 per cent and serum calcium 8.6 mg. per 100 cc. On this date she seemed to be getting more and more drowsy. Micturition and defœcation were involuntary. On the afternoon of the 23rd there was a typical convulsion of tetany. Following the convulsion, she remained in a state of complete stupor for twelve hours. The œdema had steadily increased. Parathyroid extract 4 cc. per day and thyroid administration were recommenced at this stage. The thyroid dosage was as previously. In two days' time a tremendous improvement was noted. The cough had lessened, the œdema was rapidly vanishing, her temperature was about normal, pulse 100, and she was able to amuse herself crotcheting. Thereafter there was a steady physical and mental improve-

ment. On June 14th she was allowed to sit up out of bed for the first time, apparently somewhat too soon, since tetany convulsions followed. She had had no convulsions since that date.

Condition at Present (July 4th).—The œdema has completely disappeared. She spends most of each day out of bed and round the wards. She is cheerful and happy, and states that she is "feeling fine." Her mentality is slow rather than sluggish and is steadily improving.



FIG. 3

Chemical Report.—The essential chemical and clinical details are given in the following table. The blood for calcium figures was taken six hours after an injection. The parathyroid daily dose when above 3 cc. was usually given half at 8 a.m. and half at 8 p.m.; when below 3 cc., once a day. The changes in physical condition are illustrated in the photographs. Figure 1 shows the patient on March 11th completely recovered from the attack of diphtheria, and three weeks before she was removed from the hospital by her parents. For Figure 2 the patient was so weak that she had to be supported. The photograph, taken under bad lighting conditions on May 25th shortly after re-admission, shows nevertheless the marked œdema of face, abdomen, and legs. She improved too rapidly to permit repetition. Figure 3 taken on June 26th shows an almost normal configuration, with considerable emaciation. See Table 1.

Discussion of Results.—The results detailed in Table 1 show, along with the report of progress given above, that this patient can be controlled by thyroid, so that her basal metabolic rate is kept within normal limits, and provided the dosage of parathyroid extract (Collip) be properly adjusted, her serum calcium can be kept between 10 and 11.5 mg. per 100 cc. Under these conditions convulsions of tetany gradually cease, and do not reappear unless some infection disturb the equilibrium that has been set up.

The immediate response of the serum-calcium to the parathyroid extract is shown by the six hour tests that have from time to time been carried out. The degree of response seemed to be smaller at the period of marked œdema. The long period of treatment with the parathyroid extract (from Jan. 27 to the end of June) with the concurrent beneficial results obtained, shows that with the dosage that has been employed, the treatment is an absolutely safe one.

The persistence of albumin in urine, though apparently it slowly decreases, and the slow decrease of blood cholesterol compared with the rapid disappearance of the general œdema especially during the second period of treatment (May 23rd onwards) suggest that it may be necessary to differentiate between the effect of thyroid in slowly eliminating the condition of nephrosis, and the effect of parathyroid, presumably through the re-adjustment of calcium metabolism that it produces, in depleting rapidly the tissues of œdematous fluid.

The whole of the results afford practically perfect proof of the efficacy of Collip's extract in controlling tetany of parathyroid origin.

Prognosis.—It would seem that this patient has a reasonable chance of continued normal existence, provided she can be so built up to afford increased resistance to intercurrent infections and can be trained to adjust the dose of thyroid and parathyroid to fluctuating conditions. Her future existence obviously depends upon the continued replacement thyroid and parathyroid therapy.

I wish to express my grateful thanks to Professor J. B. Collip for supplying the parathyroid extract that has been used with this patient, and for his advice during the treatment, and to Professor A. T. Cameron of the Department of Biochemistry of this University for his collaboration and assistance in the biochemical part of this work.

TABLE I
(DAILY DOSE)

Date	Weight lbs.	Urine Albumin %	Blood Cholesterol mg. per 100 cc.	Blood Urea mg. per 100 cc.	Serum Ca mg. per 100 cc.	Para- thyroid Extract cc.	Convulsions	Remarks
January 12.....	97	1.1	308	30	8.2	—	—	Previous to parathyroid treatment.
" 27.....	84	1.0	252	25	—	0.5	1	Parathyroid treatment commenced. Basal metabolic rate—5%.
" 28.....	—	1.0	—	—	—	1	0	
" 29.....	—	—	—	—	8.7	1	0	
" 30.....	—	—	—	—	8.5	2	0	Influenza with otitis media.
" 31.....	—	—	—	—	—	0	0	
February 1.....	—	—	—	—	—	—	—	
" 2.....	—	—	—	—	8.9	2	0	
" 3.....	—	1.0	264	13.8	8.5	2	0	
" 4.....	92	—	—	—	—	2	0	Basal metabolic rate—5%.
" 5 and 6.....	—	—	—	—	—	3	0	
" 7.....	—	—	—	—	—	1	0	New sample of parathyroid extract.
" 8.....	—	—	—	—	—	1.5	4	
" 9.....	—	—	—	—	7.9	3	0	
" 10 and 11.....	—	—	—	—	—	4	0	
" 12.....	—	—	—	—	10.9	4	0	
" 13.....	—	—	—	—	—	3	0	Rubella rash and enlarged cervical glands.
" 14.....	—	0.7	191	13.8	—	3	0	" " "
" 15.....	—	—	—	—	—	3	0	" " "
" 16.....	—	—	—	—	10.5	3	0	
" 17.....	92.5	—	—	—	—	3	0	Basal metabolic rate—9%.
" 18.....	—	—	—	—	—	3	1	Convulsion when attempt made to obtain blood sample.
" 19.....	—	—	—	—	—	3	0	
" 20.....	—	—	—	—	—	2.5	1	New sample parathyroid extract.
" 21 and 22.....	—	—	—	—	11.5	2	0	Serum-Ca. 8 a.m. 10.1. 1cc. extract then injected. Serum-Ca. 2 p.m. 11.5.
" 23.....	—	—	—	—	—	2.5	0	
" 24.....	—	—	—	—	—	3	1	
" 25-28.....	—	—	—	—	—	3	0	
March 1.....	—	—	—	—	—	3	0	Sore throat. Diphtheria; removed to King George Hospital.
" 2-10.....	—	—	—	—	—	3	0	
" 11.....	—	—	—	—	—	3	1	
" 12.....	—	—	—	—	—	3	0	
" 13.....	—	—	216	21	10.5	3	1	Re-admitted to Winnipeg General Hospital. Basal metabolic rate—1%.
" 14.....	78	—	—	—	—	3	1	
" 15.....	—	0.6	—	—	—	3	1	
" 16.....	—	—	—	—	—	3	0	
" 17.....	—	—	—	—	—	3	1	
" 18.....	—	—	—	—	—	3	2	
" 19.....	—	—	—	—	—	3	2	
" 20.....	—	—	—	—	10.6	3	0	
" 21.....	—	—	—	—	—	3	1	
" 22.....	—	—	—	—	—	3	0	
" 23.....	—	—	—	—	—	3	1	
" 24.....	—	—	—	—	—	3	0	
" 25.....	—	—	—	—	10.0	2	0	
" 26.....	71	—	—	—	8.8	2	0	
" 27.....	—	—	—	—	—	3	0	
" 28 and 29.....	—	—	—	—	—	2	0	
" 30.....	—	—	—	—	10.0	2	0	
" 31.....	78	—	222	13.5	9.7	3	0	Basal metabolic rate+0% Serum albumin 0.7. Serum globulin 0.5. Blood creatinine 1.4.
April 1.....	—	—	—	—	—	3	0	Discharged from Hospital.
May 19-22.....	—	—	—	—	—	0	0	Re-admitted to Hospital; in stuporous condition.

TABLE I (Continued)
(DAILY DOSE)

Date	Weight lbs.	Urine Albumin %	Blood Cholesterol mg. per 100 cc.	Blood Urea mg. per 100 cc.	Serum Ca mg. per 100 cc.	Para- thyroid Extract cc.	Convulsions	Remarks
" 23.....	107	0.8	309	15.8	8.6	1.5	1	Basal metabolic rate—5%.
" 24 and 25...	—	—	—	—	—	2.5	0	
" 26.....	—	—	—	—	8.7	2.5	0	Serum-Ca. 8 a.m. 8.4, 1.5 cc. extract then injected. Serum-Ca. 2 p.m. 8.7. Ser- um Alb. 0.5 globulin 1.1.
" 27.....	—	—	—	—	—	3	0	Vomited.
" 28.....	—	—	—	—	8.8	4	0	Serum-Ca. 8 a.m. 8.5. 2cc. extract then injected. Ser- um-Ca. 2 p.m. 8.8.
" 29.....	—	—	—	—	—	4	0	
" 30.....	—	—	—	—	10.5	4	0	Serum-Ca. 8 a.m. 9.9. 2cc. extract then injected. Ser- um-Ca. 2 p.m. 10.5.
" 31 to June 2..	—	—	—	—	—	4	0	
June 3.....	—	—	—	—	11.1	4	0	
" 4.....	—	—	—	—	—	4	0	Vomited.
" 5-7.....	—	—	—	—	—	4	0	
" 8.....	—	—	—	—	—	2	0	
" 9.....	74	0.7	298	20	—	2	0	Basal metabolic rate—8%.
" 10.....	—	—	—	—	—	2	0	Blood creatinine 1.5.
" 11.....	—	—	—	—	11.2	2	0	Vomited. (She was given
" 12.....	—	—	—	—	10.8	2	0	permission to
" 13.....	72.5	—	—	—	—	2	0	get out of bed,
" 14.....	—	0.6	—	—	—	2	3	Vomited. which may
" 15.....	78	—	—	—	—	2	0	have been too
" 16.....	78	0.7	—	—	—	2	0	early consider- ing her weak condition.
" 17.....	—	—	—	—	11.7	2	0	Globulin 1.0.
" 19.....	—	—	—	—	—	2	0	
" 22.....	—	0.4	—	—	—	2	0	
" 24.....	—	0.4	—	—	—	2	0	
" 25.....	—	0.5	—	—	—	2	0	
" 26.....	85	—	287.3	20.5	10.2	2	0	Serum Albumin. 0.8. Serum Globulin 1.
" 29.....	—	—	—	—	—	2	0	Basal metabolic rate—11%
" 30.....	—	0.5	—	—	10.2	2	0	
July 1.....	—	—	—	—	—	3	0	Thyroid increased by one tablet every second day.

NOTE ADDED JULY 20TH, 1925

Since the above was sent to press this patient again contracted an acute infection, and died on July 17th. The final history and result of post mortem examination are given briefly.

On July 4th a slight erythema was noted in the upper right arm, and her temperature rose to 104°, subsiding next day. A more marked erythema appeared on the right groin on July 6th. At about this time some diarrhoea became noticeable. Temperature was normal from the 6th to the 13th.

On July 9th the blood urea was 20.5, creatinine 1.5, cholesterol 198, serum calcium 11.4, basal metabolic rate minus 7 per cent., and body-weight seventy-four pounds. The daily dose of Collip's extract was decreased to 2.5 cc.

On July 13th severe diarrhoea set in with vomiting, and temperature rose to 102°. Extract of parathyroid was discontinued. The diarrhoea did not yield to any treatment. Stools were dark green and liquid, with a very offensive odour. Neither stools nor vomit were blood-stained.

On the morning of July 17th she had a definite tetanic convulsion. A single dose (2.5 cc.) of Collip's extract was given. She died on the afternoon of this day, apparently as the result of a severe toxæmia of undetermined origin, but obviously in no way connected with the treatment.

Post mortem findings.—Dr. J. M. McEachern of the Pathological Laboratory of the General Hospital conducted the post mortem, and Dr. R. T. McGibbon, Assistant Professor of Anatomy, dissected out the parathyroids. My thanks are due to them for their care and assistance.

No definite abnormality was found except in the thyroid, parathyroids, and kidneys. The stomach and intestines contained no blood-stained fluid, and showed no evidence of hæmorrhage. There was evidence of slight fatty degeneration of the liver.

Thyroid.—Weight 26 gm. Very small, atrophic, and very pale in colour. On section there appeared to be a slight increase in fibrous tissue. The microscopic picture, while not definitely myxedematous, was that of a very inactive gland. The acini were filled with colloid, and the epithelium lining them was of low cuboidal type. The blood-vessels showed great thickening, and there was an increase in interlobular fibrous tissue. There was no evidence of hyperplasia and no collections of lymphoid cells were found.

Parathyroids.—No parathyroids could be found in either upper or lower normal positions. Two were found in the median position. The left one was somewhat atrophied. Microscopically, the right was apparently normal. The left, smaller in size, contained parathyroid tissue, but there was a much larger amount of fibrous tissue than one would expect to find.

Kidneys.—The right weighed 210 gm., the left 200,

both being somewhat larger than normal. On section the right kidney showed extremely congested pyramids with flame-shaped deposits of a fatty nature surrounding them like a halo, the depth of these areolæ being 2 mm. The vessels were not especially prominent. The left kidney did not show such a degree of congestion. The microscopic picture showed the glomerular areas to be singularly free from damage. The tubules, on the other hand, especially the convoluted variety, presented a most

striking picture—widely dilated, the lining cells swollen, cytoplasm broken and degenerated, and the lumina containing degenerated epithelium cells. Staining with Scharlach R. showed the cells lining the convoluted tubules to be laden and crammed full of a red staining lipid material, most probably cholesterol.

The post mortem findings are therefore evidently in agreement with the original diagnosis of subthyroidism, subparathyroidism, and chronic nephrosis.

ATELECTASIS OF THE LUNG*

H. A. FARRIS, M.D.

Medical Superintendent, St. John County Hospital for Tuberculosis

IN recent years a great deal of interest has been taken in massive collapse and, on account of this, other atelectatic conditions of the lung have also received much attention.

Having a number of, what seem to me, very interesting cases that demonstrate a number of points that have not been brought out in any of the articles I have read, it seemed to me these might be worth recording. I therefore desire to report seven cases of atelectasis of the lung, including one case of massive collapse. The latter was seen by me in consultation. The points I wish to bring out are: (1) Atelectasis of the lung is a much more common condition than is usually recognized, and the causes of atelectasis are numerous; (2) there are no physical signs characteristic of atelectasis; breathing may be of almost any type and râles may or may not be present, and the x-ray, with the history, is the only method of making a positive diagnosis; (3) fibrosis of the lung and atelectasis of the lung are not infrequently confused; (4) atelectasis of the lung can produce intense abdominal symptoms, including vomiting, diarrhoea, cramps, marked anorexia, etc.; (5) atelectasis can produce a pressure on the recurrent laryngeal nerve, causing hoarseness; (6) the negative pressure of atelectasis can produce intense cardiac distress; (7) the heart may be displaced so close to the chest wall in the axilla, and the x-ray shadow be so dense and homogeneous that the position of the heart is not recognized and as a consequence it may be punctured on aspirating the chest; (8) pneu-

mothorax treatment should be instituted in cases of atelectasis to give at least symptomatic relief, and is especially called for in massive collapse of the lung; (9) in chronic cases, if adhesions preventing pneumothorax have been established, a thoracoplastic operation should be done.

Case No. 1.—R. L., stableman, age fifty-three years. Pneumonia thirty years previous—not well since, having cough and dyspnoea. Six months before admission he developed acute symptoms of dyspnoea, weakness, and loss of appetite. At the time of admission he had a very severe cough, no expectoration whatever, marked dyspnoea on the least exertion, anorexia, insomnia, and great weakness, with a temperature slightly subnormal and pulse never exceeding ninety-six. Wassermann negative, hæmoglobin 75 per cent., red cells 3,994,000 and white cells 15,280. After being in the hospital about



Case No. 1.—Dense homogeneous shadow left lung. Original film shows trachea over to the left and the heart concealed in the shadow, but well toward the axilla. Diaphragm high. (In this and some of the other pictures the outline of the trachea has been marked).

*Read at the Annual Meeting of the Canadian Tuberculosis Association, Montreal, May 14, 1925.

five weeks his temperature became slightly erratic, and would occasionally shoot up to 100° for one or two days. He lived sixty-three days after admission.

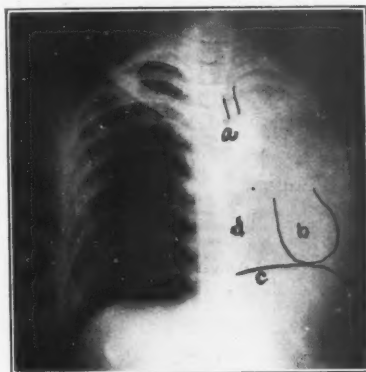
At the time of his admission he had, on the left side, greatly diminished expansion with retraction; absolute dullness; almost absent breath sounds, excepting at the apex where there were bronchovesicular breathing and medium moist râles. There were very harsh breath sounds over the right side with a few râles at the apex. A diagnosis of chronic pneumonitis was made. The patient died practically of starvation and loss of sleep. The x-ray at the time of his admission showed a dense homogenous shadow over the left lung, excepting at the apex where there was some illumination. Trachea was pulled over to the left side. The heart was over to the left axilla and the diaphragm very high. There was some clouding in the right apex.

Autopsy showed no adhesions present; the heart well over to the axilla on the left side and the trachea also well to the left. There was a caseous mass about one and a half inches in diameter pressing on and obliterating the main bronchus on the left side and an atelectatic condition of the left lung with a marked bronchiectasis throughout the whole lung; the bronchi contained much thick pus. Unfortunately this autopsy was very incomplete and no further records than these were made.

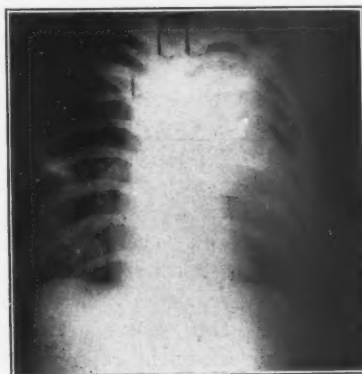
It is very suggestive that the altered position of the mediastinum and the diaphragm affected the vagus and sympathetic nerves greatly and probably this to a great extent was the cause of his anorexia. It is remarkable that his pulse and temperature remained about normal, but his pulse was probably influenced by the pressure on the vagus nerve. If the condition had been recognized, it is quite possible that pneumothorax might have given him at least temporary relief, as was demonstrated in the next case.

Case No. 2.—A few weeks after the death of Case No. 1, a girl, age twenty-three, was admitted to the hospital very acutely ill, almost moribund. She had had a left apical tuberculosis four years before, made a good recovery and had been working for two years. She had no râles and no evidence of moisture in her chest at the time she was allowed to return to work. She then looked well and weighed 125 pounds. She worked as a clerk and had to work

very hard. During this period she had recurring attacks of bronchitis lasting many weeks at a time. About six months before admission she became miserable with cough and expectoration returning. She had some shortness of breath, with pain and tenderness; her digestion became poor. Two months before admission she stopped work and rested for a week. Her mother developed pneumonia and the patient went home and had to take care of her for five weeks. As a result she became acutely ill, developing diarrhœa, cramps, and loss of appetite. Her cough became loose with about two ounces of expectoration each day. She became very hoarse and vomiting developed three weeks before admission, and since then had been confined to her bed, unable to retain food and suffering from severe cramps with diarrhœa; the urine became scant, and was passed only once in twenty-four hours.



Case No. 2, A.—Homogeneous shadow over the lung; (a) position of trachea; (b) heart (outlined); (c) diaphragm; (d) clear area between heart and spine.



Case No. 2, B.—After 400 cc. of air. Plate taken immediately, showing mediastinum has returned to normal position.



Case No. 2, C.—After complete collapse of the lung.

At the time of her admission she was apparently a hopelessly ill girl, very hoarse, with a loose productive cough, expectoration amounting to about two ounces, and loaded with tubercle bacilli, severe night sweats, weakness, vomiting of food, cramps with diarrhoea eight to nine times a day; her temperature was 104° and her pulse 132. Expansion was very slight over the left side, with absolute dullness and feeble breathing; bronchovesicular breathing at the apex; large moist râles over the whole left lung; pleural rub at the left base posteriorly; vocal resonance very greatly increased at the left apex. There was harsh breathing over the right with a few râles at the right base anteriorly. The x-ray of chest showed a dense homogeneous shadow over the left lung except at the apex where there was some slight illumination. The trachea was well over to the left and the heart well beyond the sternum. The diaphragm was high. Atelectasis of the lung was diagnosed and a needle inserted, giving the reading minus 160 mm. minus 100 mm., mean pressure minus 120 mm.; 400 cc. of air were introduced with immediate relief of symptoms and the manometer reading changed to minus 80 mm. minus 20 mm. The fluoroscope and x-ray films showed the heart back to normal position and she has since had no abdominal symptoms or hoarseness whatever. Her cough and expectoration immediately improved and continued to improve. Pneumothorax was continued and eight days after starting the pneumothorax her temperature became normal. Her progress forward was steady. She gained weight rapidly. She was discharged quiescent one and a half years after admission. She then had mucoid sputum with no tubercle bacilli. The amount of weight

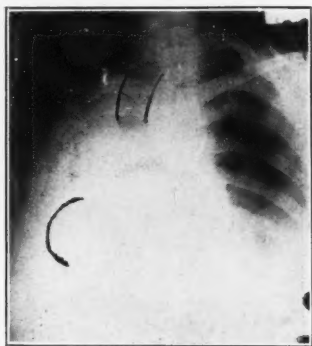
gained is not known as she was too sick to be weighed at first. At time of discharge she weighed 133 pounds and was the picture of health. Since that her pneumothorax has been kept up, but recently she nursed her brother in an acute illness and had somewhat of a relapse. She is now in the hospital continuing pneumothorax treatment, but is doing remarkably well. I am advising a thoracoplastic operation as apparently it will be necessary to continue pneumothorax treatment permanently and a thoracoplastic operation would be preferable to this.

The cause of the atelectasis can only be guessed and was probably due to the pressure of a gland. The diagnosis of atelectasis was made on the history of the case, the fairly acute development, the marked displacement of the mediastinum to the left and the homogeneous shadow in the x-ray. The manometer reading, the ease of giving gas and the complete collapse of the lung with the return of the mediastinum to normal position verified this. It seems as if this girl could only have lived a very few days without pneumothorax treatment. It would probably have been wiser if we had not done a complete pneumothorax on this girl, but had only done a partial one and treated her symptomatically, as it is possible that with pneumothorax just sufficient to give symptomatic relief that the lung might have re-expanded as the obliteration of the bronchus might have been relieved gradually.

Case No. 3.—Mrs. T., age fifty-six, had pneumonia eight years ago. She was well for one year and then became poorly and lost weight and strength. She was told her lungs were affected. She became fairly well for three years, when she had "flu" and a hæmorrhage. She has been in bed practically ever since, although strictly only for one year.

On admission she was an obese flabby looking woman, weighing 166 pounds. She was very dyspnoeic with cough and expectoration; no tubercle bacilli in sputum. She was very weak, easily fatigued, a poor sleeper, had a good appetite, no palpitation. She had absolute dullness over the right; an impaired note at the left apex; very marked retraction over the right; bronchovesicular breathing, whispered pectoriloquy and large moist râles over the whole of the right lung. There were scat-

tered râles over the left with harsh breathing. The left border of heart could not be located. Wassermann negative. Temperature normal at all times. Respiration 22, pulse 80 to 96. X-ray examination showed a dense homogeneous shadow over the right lung, with a marked displacement of the mediastinum to the right and the right diaphragm high. There were increased linear markings throughout the left lung. Atelectasis of the lung was considered and a needle inserted, but no reading could be obtained. Diagnosis was later made of chronic fibroid tuberculosis (?). She improved somewhat and a thoracoplastic operation was advised to relieve the pressure on the heart, but, owing to special conditions, this was refused. She went home and in about six weeks developed acute cardiac symptoms and died.



Case No. 3.—Dense homogeneous shadow. Trachea well into right apex. Original film shows clear area between the spine and heart, (right border outlined) which is over to the right axilla.

An autopsy was permitted and a complete atelectatic condition of the right lung was found with the heart pulled over to the right axilla and the trachea well beyond the sternum. The diaphragm was up to the upper border of the fourth rib. There were very dense pleural adhesions. There was no evidence of tuberculosis and the left lung seemed normal. The pathologist's report on cause of death was myocarditis. The cause of the atelectasis could not be demonstrated. The right lung was a small, hard fibrotic mass.

The interesting point about this case is that if a thoracoplastic operation had been done it would probably have saved her life by allowing the heart and mediastinum to have returned to nearly normal position. Again it is difficult to explain the pulse being below 100, unless it was due to irritation of the vagus nerve.

Case No. 4.—A female patient, age twenty-five, was admitted to the hospital from the Provincial Hospital, where she had been treated for four years for manic-depressive insanity. The first signs of tuberculosis were noticed about two months before admission; but on admission the disease appeared to be far advanced tuberculosis, and her case apparently hopeless. She was very toxic looking. She had marked dullness over the left lung, the right upper, and right base anteriorly. Expansion



Case No. 4, A.—Taken March 31st. Dense homogeneous shadow. Trachea very slightly displaced. Considerable portion of upper lobe clear.

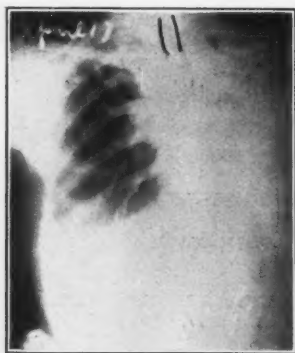


Case No. 4, B.—Taken April 4th. Trachea considerably to the left. Clear area of upper lobe much smaller.

was diminished on the left side; large moist râles were heard over the left side and right apex. Whispered pectoriloquy and harsh breathing on the left side and bronchovesicular breathing on the right side. The teeth were apparently all in a bad state with abscesses at their roots. She had considerable œdema of the legs. She was considered to be a far advanced, apparently hopeless case of tuberculosis and the only treatment given was to make her comfortable. Her temperature remained around 101° for a year and a half

before she started to improve and the improvement then was fairly steady. Her teeth were gradually extracted and her improvement was steady. She gained in weight from seventy-eight up to 120 pounds. Three and a half years

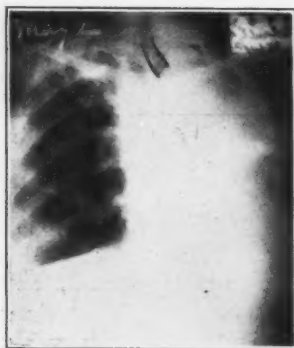
and around, but the heart and mediastinum continued to be drawn over to the left. A needle was inserted, but no manometer reading could be obtained and apparently the needle punctured the left ventricle, as there was a sud-



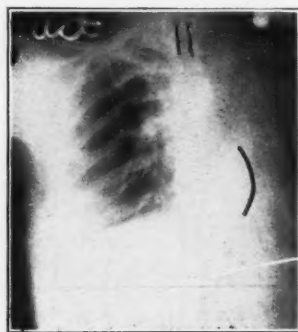
Case No. 4, C.—Taken April 17. Trachea further to the left and clear area of upper lobe much smaller.



Case No. 4, E.—Taken June 1st. Retraction is still more marked.



Case No. 4, D.—Taken May 2nd. Trachea well to the left. No clear area at top of lung. In original film it shows clear area along left border of spine, between it and the heart.



Case No. 4, F.—Taken October 30th. Shows case after second stage thoracoplastic operation. Trachea central and heart (left border outlined) back to about normal position.

after admission she developed acute tonsillitis and had a marked flare-up of the disease in the chest. At this time an x-ray was taken, and we found a condition that was suggestive of atelectasis. No previous films had been taken so it was difficult to be sure it was not just fibrosis. Films were taken one week later and repeated again in two weeks. These showed a rapid pulling over of the mediastinum to the left, where there was a dense homogeneous shadow. There was practically no change in the physical signs in her chest. Owing to the rapid pulling over of the mediastinum, the diagnosis of atelectasis was made, as no other condition could make this change in a week. She improved so that at the end of a few weeks she was again allowed to be up

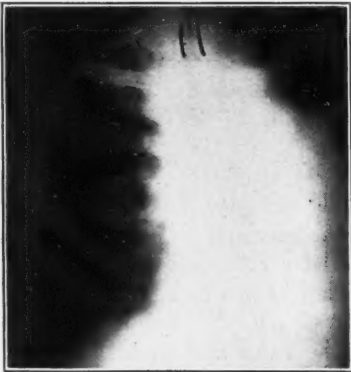
den gush of blood under high pressure into the syringe. The patient felt no discomfort. A thoracoplastic operation was later done in two stages. After the removal of the lower ribs the films showed the heart had returned nearer to the mid-line. After the second stage the heart was close to the mid-line and the trachea almost central. Two months later she was discharged quiescent, in good general condition. This is a remarkable case and seldom has one seen so sick a patient, sick so long a time, make such a recovery. She was in the hospital 1,300 days. The thoracoplastic operation allowed the strain on the heart to be relieved.

Case No. 5.—A man, age forty-eight, complained of pain, dyspnoea, and much cough. He entered the General Public Hospital and

some bloody fluid was aspirated from his chest. X-ray films showed a large dense mass in the upper part of the left lung and a diagnosis of sarcoma was made. Another physician diagnosed loculated pleurisy. A few weeks later I examined him and took x-ray films. At this time he was very hoarse and dyspnoic, and had some pain. The heart and trachea were pulled well over to the left and there was a dense homogeneous shadow over the whole left lung. The diagnosis of sarcoma with atelectasis was made. About three months later he seemed

and the pressure on the laryngeal nerve. An autopsy soon after this showed a sarcomatous mass filling nearly the whole thorax.

Case No. 6., which I wish to discuss, showed the possible presence of atelectasis at the beginning of treatment and almost certain atelectasis developing later in a case of chronic tuberculosis. The patient is an ex-sailor, age twenty-two, with chronic advanced pulmonary tuberculosis. He had extensive signs in the upper half of the right lung and also some signs in the upper left. Physical examination sug-



Case No. 5, A.—Dense homogeneous shadow over whole lung. Trachea considerably to the left. Right border of heart not visible.



Case No. 6, A.—Dense homogeneous shadow at apex. (Film shows this a more dense homogeneous shadow). Trachea pulled into apex.



Case No. 5, B.—More dense shadow. Trachea back to normal position and the right border of heart is over to the right a considerable distance.

rather better. His dyspnoea was not so marked and his hoarseness had disappeared. X-ray films at this time showed a dense homogeneous shadow over the left lung, but the heart and trachea were back to the normal position. Evidently the mass in the chest had progressed reducing the negative pressure caused by the atelectasis, so relieving the cardiac symptoms



Case No. 6, B.—Taken two months later. Trachea still farther to the right and the markings to the right of the spine show a clear area between the left border of heart and spine, as shown in the original film.

gested consolidation of the upper right. X-ray examination showed a marked pulling over of the trachea to the right and a dense homogeneous shadow in the upper third. At first this was considered fibrotic, but more recently we suspected it was partly atelectatic. About two months later he had a hæmorrhage and an acute flare-up in his chest. He became much weaker,

more dyspnoëic, with a high fever. He then had marked dullness over the whole left side, bronchovesicular breathing, whispered pectoriloquy and large moist râles. X-ray examination showed a dense homogeneous shadow over the whole lung and the heart pulled well over to the right beyond the spine and this was within two months of the previous film. This must be an atelectatic condition as no other condition that I am aware of could produce this marked moving over of the mediastinum, especially where there was very little disease in the lower half of the right lung previously. It is probable that part of the upper right earlier condition was atelectatic in addition to fibrosis and that the lower condition is now atelectatic. This man has a tuberculous bowel and a marked lesion in his other lung, so that it does not seem that we would be justified in attempting a thoracoplastic operation, especially as he is fairly comfortable. Adhesions prevent pneumothorax treatment.

Case No. 7.—This is a case of massive collapse that I saw in consultation. This patient was a boy aged nineteen. He entered the General Public Hospital for an operation for separation of omental adhesions. He was admitted in good general condition but a note on his chart states that his hands were cold and cyanotic, and that he stated they were always like this. Twenty-four hours after his operation he developed pain, dyspnoëa and severe cough. Tem-

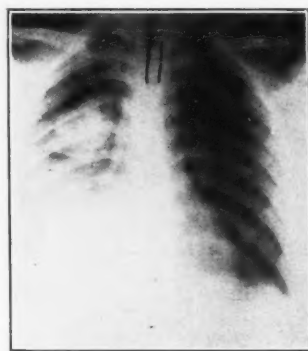
tard plaster for pain. Four days after operation he was x-rayed and the report describes a dense homogeneous shadow over the right lung with no displacement of the mediastinum and fluid was suspected. Six days after the operation he was aspirated for fluid, but no fluid was obtained.

Ten days after the operation I saw him in consultation. At this time he was feeling comfortable and sitting up in bed, with normal temperature and pulse, but dyspnoëic on exertion and a very tight feeling in his chest. He had considerable cough and expectoration. Examination showed intense dullness over the whole right side, excepting along the spine, where it was resonant. There was bronchovesicular breathing over the whole right side and a few scattered râles. Whispered pectoriloquy over the whole side. On examination of former x-ray films now there could be made out that the mediastinum was pulled over to the right. Massive collapse of the lung was diagnosed. While he had no acute symptoms at this time, it was felt that partial pneumothorax would do no harm and might do considerable good. Initial reading of the manometer showed minus 80 mm. minus 60 mm., 300 cc. of air changed this to minus 40 mm. minus 30 mm. Breath sounds became more distant anteriorly, but the lower half of the chest was not much changed. He claimed he felt more comfortable. X-ray taken at this time showed partial pneu-



Case No. 7, A.—Dense homogeneous shadow over whole right lung. Left border of heart can be seen in fairly normal position, but the trachea, as outlined, is pulled over to right.

perature 101 2/5°; pulse 140; respiration 50. He required morphia for pain and three days later he had much expectoration, blood streaked, and for four days he was given mus-



Case No. 7, B.—Shows same case after 300 cc. of air injected. Trachea is back to normal position. Film a week later showed this lung completely clear.

mothorax and the trachea back to nearly normal position. X-ray film taken a week later showed the lung cleared with possibly a little haziness. The patient was discharged three weeks after his operation.

An interesting sequel to this case is that Dr. Kelly again operated on him about two months later and he again developed massive collapse on that side, diagnosed by Dr. Kelly and Dr. Kirkland, by physical examination and x-ray. It cleared up in a few days without any treatment. The recurrence of this massive collapse is most interesting and suggests nervous origin, especially as the chart of this boy records that his hands were always cyanotic and cold and he was very neurotic.

Pneumothorax in this case was not given for immediate relief but was given more to demonstrate how easily it could be done and that it should be done immediately when acute symptoms develop. It seems strange that there is such a prejudice against pneumothorax in these cases. If a needle were just inserted until a little air could be heard entering the pleural space, enough air, not necessarily filtered, could be allowed to enter to relieve the acute symptoms. It is difficult to see how this could possibly do any harm and it seems very reasonable that if it could relieve the acute strain on the heart, that it must occasionally be a life saver, to say nothing of relieving symptoms. Recently in one of the large American cities I saw a case of atelectasis of the lung, probably due to cancer pressing on the bronchus, in two different hospitals and in each case the patient was suffering most intensely from cardiac symptoms, due to displacement of the heart, and yet the prejudice against pneumothorax prevented the physician from attempting to use pneumothorax to relieve the symptoms. To one accustomed to pneumothorax treatment, it is difficult to understand this.

That displacement of the diaphragm can cause intense gastric distress is also shown by a case of phrenicotomy that we did recently. The left phrenic nerve was cut and the diaphragm on that side went up to the fourth rib. The patient complained soon afterwards of marked gastric distress. The x-ray film showed the stomach pulled up out of the normal position and it seemed that this caused the gastric distress.

Summary.—These cases demonstrate that atelectasis of the lung occurs not infrequently, especially among patients in a tuberculosis institution, and that it is frequently confused with fibrosis. Case No. 2 demonstrates the immediate relief that may be given some of these patients by pneumothorax treatment. The return of the

mediastinum to the normal position after thoracoplastic operation was shown well in Case No. 4. Case No. 1 would probably have been given much relief if a pneumothorax had been instituted. Case No. 3 apparently died of cardiac failure and would probably have been saved by an early thoracoplastic operation. In case No. 7 the operation to produce a pneumothorax was performed too late to be of any marked benefit, but it demonstrated the ease with which it can be done and the ease with which it secures a replacement of the mediastinum to normal position, although a very small amount of gas was given. A needle inserted into the pleural space and air allowed to enter immediately massive collapse occurs, should give immediate relief to many of the symptoms. The amount of air to be given would depend entirely on the symptoms, as this is given for symptomatic relief only.

I understand the bronchoscope is being used in these cases of massive collapse and immediate relief given by sucking out the mucous, but this seems very heroic treatment for such sick patients. If the condition of pneumothorax were first instituted, the patient would be less dyspnoëic, and it would allow the trachea to go back to normal position, which should make the passing of the bronchoscope much easier, if such operation was then considered necessary. Many other cases of atelectasis require the passing of the bronchoscope, especially for diagnosis, and in quite a percentage of these cases, if the condition of pneumothorax was first instituted, it would permit the easier passage of the bronchoscope by lessening the dyspnoëa and straightening the trachea. Some men maintain that in massive collapse there has possibly been a pneumonia first. If the simple operation for securing a pneumothorax was performed early in one of these cases, it would very easily demonstrate whether there was any consolidated lung underneath or not and this would add still more valuable information on massive collapse.

The marked abdominal symptoms in two of these cases, in which one was relieved immediately by the pneumothorax, and the hoarseness in two others, due to displacement of the mediastinum, in which one was relieved immediately by the pneumothorax, and the other relieved by a sarcomatous growth replacing the negative pressure, is very interesting.

THE TUBERCULOSIS SURVEY OF SCHOOL CHILDREN IN ALBERTA, 1924*

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Calgary, Alberta

THE survey was carried out in eight districts in an effort to get children representative of Alberta public school life. Thus in Edmonton and Calgary, two schools in each city were chosen, one with children mostly Anglo-Saxon, the other with children of various nationalities. Blairmore represented a mining community of 2,500 population in the mountains; Lethbridge and Medicine Hat, two prairie cities of from 10,000 to 15,000 population. Four rural schools in the Medicine Hat district were included. It was desired to know if repeated crop failures in this section had had any reaction on the physical condition of the children. Smoky Lake was chosen because it is a centre of Ukrainian people, and hospital facilities were afforded for x-ray work. The Indian Industrial School near Edmonton afforded an opportunity for the examination of Indian children. The work was done in the schools, and only those examined whose parents gave consent, and without any selection as regards health.

In every case the medical examination included a short history, temperature, and pulse readings on two afternoons, measurement of weight and height, special attention to the presence of glands, and chest examination, an intracutaneous tuberculin test, read after forty-eight hours and repeated if doubtful or negative. Nose and throat examinations by specialists and dental examinations by dentists, were made in nearly all cases, and in some schools, eye and ear examinations. Stereoscopic x-ray films were taken in over 960 cases. All reactors and suspicious looking cases were given special examination by a sanatorium physician, and sputum examinations were made where indicated.

Over 800 chest examinations were made by one physician, and nearly all tuberculin tests were made and all were read by this same physician, so that as far as possible the same standards were followed.

The number of children examined was 1,136, eighty-five of whom were Indians.

It was noticed that the reactors to the tuberculin test (I.C.) were fewer than reported in other provincial surveys. The question of the potency of the tuberculin was raised. However, a fresh standardized product was obtained, and used in over 200 cases. The results were the same as with the tuberculin previously used, so that it was felt that the tuberculin used was potent. The test was read in forty-eight hours, and repeated in doubtful or negative cases. In this way twenty-three, or 16 per cent of the reactors were read as positive which otherwise might have been considered doubtful or negative. Out of 1,051 public school children, 144 or 13.7 per cent. were reactors.

The percentage of reactors increased with the age. The reactors found were as follows:—at six years, 6.3 per cent.; at thirteen years, 21.4 per cent.; while from thirteen to seventeen years of age, 22.8 per cent. The two larger cities had the largest number of reactors; i.e., 18 per cent. respectively. The Ukrainian district came next, while the smaller communities and rural districts varied from 6 per cent to eleven per cent. The Alberta born children showed approximately one-half as many reactors as did those born elsewhere. Children whose fathers were born in Canada reacted in slightly greater proportion than did those of other racial origins.

It was of interest to find that in the so-called drought area, where economic conditions have been severe for years, no increase in reactors was found. In fact, the children quite equalled in general healthy appearance those found in more prosperous districts. Fewer cases of children 10 per cent. or more under standard weight were found here than in any other district, except among the Ukrainians. These last surpassed all others in general nourishment.

Signs, physical, and x-ray, considered suspicious of chest disease, were found in twenty-four or 2.1 per cent. of the total. Signs con-

*Read at the Annual Meeting of the Canadian Tuberculosis Association, Montreal, May 14, 1925.

sidered definite for tuberculosis, recent or remote, were found in nine cases, or 0.9 per cent. of the total, and of these, six or 0.6 per cent. had active tuberculosis.

No definite cases of tuberculosis of the cervical glands were found; in fact, no large gland masses were discovered. In only one child was there a history of an operation for cervical adenitis, and this had been done some years previously in Scotland. No cases of active bone tuberculosis were found—naturally children suffering from either of these conditions would not be in the schools. No relation could be established between reaction to tuberculin and malnutrition, elevated temperature, or unhealthy mouths, noses, or throats.

The Indian children, numbering eighty-five, were older than those in the public schools. They were obviously of a different type, being sturdier and very well nourished, so that comparison with the others would be quite misleading. The reactors among these were seventy-

eight or 91.8 per cent. This corresponds very closely with the findings in the Saskatchewan survey. Those with chest signs, or x-ray evidence, or both, suggestive of chest disease, were twenty-one or 24.7 per cent. of the total. Definite signs of clinical tuberculosis, recent or remote, were found in six or 7.1 per cent. of the total. Those requiring treatment for active tuberculosis were three or 3.6 per cent. Three of the children had had operations on the neck for glands, presumably tuberculous.

Summary

1.—The reactors in this survey of public school children were 144 or 13.7 per cent.

2.—Those found to have active tuberculosis were six or 0.6 per cent.

3.—Fewer reactors were found than reported in other provincial surveys to hand.

4.—Sixteen per cent of the intracutaneous tuberculin reactions were not definitely positive on the first test, but were on the second.

THE TRAVELLING DIAGNOSTIC CLINIC FOR DISEASES OF THE LUNGS*

G. C. BRINK, M.D.

THE travelling clinic is largely a development of recent years. There are two types of such clinics. The object of the first type is to bring the opportunity for diagnosis to the patient instead of waiting for the patient to come to the clinic. An advance agent precedes the clinic and notifies physicians, various societies, and the public that a clinic will be held on a certain day and at a certain place, to examine and advise any persons wishing to attend. The advance publicity of such a clinic appeals directly to the public and indirectly to the physicians. It has distinct disadvantages, and the objections which this work has met from general practitioners is warranted. The method is decidedly unethical. Unselected cases will undoubtedly present themselves and take up time and energy.

The second type of clinic makes its appeal directly to the physician and is really a consultation clinic. Only patients who are referred by physicians are admitted. If the facilities of the clinic are efficient, it is a diagnostic aid to the medical profession, not in proximity to a stationary clinic or sanatorium.

Varying factors in different districts make necessary different methods under which the second type of clinic is conducted. Believing that the Ontario Department of Health was one of the first to organize this type of clinic, an outline of the organization may be of value.

Organization of Clinic Centres.—Arrangements for the organizing and conducting of these clinics are made with the co-operation of the practising physicians and the local boards of health in the different centres. One of the staff from headquarters of the Provincial Department interviews the local medical officer of health

*Read before Canadian Tuberculosis Association, Annual Meeting, Montreal, May 14, 1925.

and the president and secretary of the local or county medical association and outlines to them the objects of the clinic and the methods under which it is conducted. If this is not possible, a circular letter giving all the information about the clinic is sent to the medical association of the district. The acceptance of the clinic is left entirely with the physicians concerned and a clinic is not established unless the physicians are in full accord.

The local board of health of any municipality accepting the clinic is expected to furnish three rooms, one for the clinical work, one for the dark room, and one for a dressing-room. Three small tables are required, with about six chairs. The clinic is preferably held in a hospital. If a hospital is not available, a hotel or some public building is utilized.

About one month prior to the visit of the clinic to the centre, a circular letter is sent out from the head office but through the local medical officer of health, to every physician within the area. This letter contains information as to the location and date of the clinic. The secretary of the medical society or the medical officer of health is given the task of allotting the appointments of the physicians.

Staff, Equipment and Conduction of Clinic.

—The staff of the clinic is composed of one or two physicians and a nurse. The equipment consists of a portable x-ray unit, including x-ray machine upright cassette holder, dark room, clinical history forms, sputum specimen bottles and the necessaries for throat examinations and tuberculin tests.

The duration of a clinic varies from two to six days. With one physician working, the examination of eight adults or twelve children is considered a full day's work. Without a trained nurse this number of examinations would not be possible. She records the temperature, pulse, and weight and when trained is competent to secure the greater part of the history, and take charge of the routine x-ray work, thus permitting the clinician more time for the examination and discussion of the case with the physician concerned.

Rules of Clinic.—No case is admitted to the clinic unless brought in or referred by a physician. The referring physician is always encouraged to be present at the examination. No information is given the patient when at the clinic, but a report is forwarded to the physician after

the return of the clinic to headquarters, where the x-ray films are developed and all data correlated. X-ray films (usually stereoscopic) are taken on all cases.

It was at first thought that examination should be limited to early, moderately advanced, and contact cases. However, it was soon apparent that physicians should not be discouraged from bringing in advanced cases, because of the following factors:—

(1) Pneumo-thorax treatment is indicated in many advanced cases, a certain percentage of whom may be admitted to a sanatorium for treatment.

(2) The admission of an advanced case to a sanatorium removes the source of infection from the home and community.

(3) The presence of an advanced case at the clinic offers an opportunity, for those interested, to get in touch with the contacts.

Literature published by the Canadian Tuberculosis Association is given only to patients in which the diagnosis is definite at the clinic or to present contacts.

The question arises as to who should or should not be admitted to a travelling clinic. The location of the clinic centre will have much to do with the ruling made. It is apparent to all that if a clinic is being held in moderately close proximity to a city in which men have for years been spending time and money in training themselves in the diagnosis and treatment of tuberculosis, that it is most unfair to these physicians if people who are well able to pay a physician's and radiologist's fee should be given a free examination at the clinic. Where special advice is not within reasonable distance the above question does not exist. A large amount of the tuberculosis work in the past has been done by the physicians classed as chest consultants, and to such every consideration should be given.

During the year the work has been in operation in Ontario, the co-operation of the physicians in the districts in which clinics have been held has been most encouraging. The interest shown both by the profession, and the public is indicative of a better understanding of tuberculosis and an appreciation of the value of early diagnosis and treatment.

I should like to record here the appreciation of the Provincial Department of Health for the assistance given by the Ontario members of this

Society (I refer chiefly to those doing consulting practice and those associated with sanatoria) in the planning and carrying out of our pro-

gramme. Whenever advice has been sought it has been willingly given and at the expense of their time.

TREATING TUBERCULOSIS IN THE DRY CLIMATE BELT*

A. D. LAPP, M.B.

Medical Superintendent, Tranquille Sanatorium, B.C.

THE subject of this paper is the choice of the Programme Committee of the Association, and not my own. When the question of climate enters into a discussion of the treatment of tuberculosis, one may confidently expect some difference of opinion. After experience in treating tuberculosis in different parts of Ontario, and also at Ste. Agathe, Quebec, and in the dry belt of British Columbia, I would not care to make extravagant claims for any particular climate; in fact, there is probably little difference in treating tuberculosis in the dry belt and outside of it.

Most authorities who have written on the subject have agreed that climate is a factor in the treatment of tuberculosis. The importance of this factor, however, is a point on which there seems to be little agreement. The majority believe, and I share this belief, that climate should be regarded as secondary to proper care under skilled medical direction. It is agreed, also, that while there is no ideal climate for the treatment of tuberculosis, the nearest approach to it is one in which there is dry, clean air, a maximum of sunshine, freedom from extremes of temperature and a low humidity, all at a moderate altitude. The dry climate belt of British Columbia conforms fairly closely to these conditions.

Our own British Columbia dry belt is, I believe, superior in some respects to that of the southwestern States, although, as Dr. Cornick of Texas says, patients from the south probably do better when they go to a dry climate nearer their own parallels of latitude, than they would farther north. In the valleys of the British Columbia dry belt the winters are comparatively mild, the average temperature for the

coldest month being only a few degrees below freezing. Spring sets in very early, usually in February, and very agreeable weather is experienced until the end of June when the first hot days of summer occur. The heat is never excessive, very rarely going over 90° F. On the hottest days the humidity is generally very low, and the heat is not nearly so oppressive as are much lower temperatures in a more humid climate. There are usually two periods, of a week or ten days each, when patients find the days uncomfortably hot, but owing to the cool breeze which sets in every evening shortly after sundown the nights are cool and refreshing, and at least one blanket is necessary throughout the summer.

As cold air is stimulating, and most tuberculous patients feel well in the autumn and winter, it is the heat experienced in the dry belt which comes in for most of the criticism. Our death rate is not highest during the summer months, or the months following them, but during the spring and early summer. If this means anything, it does not mean that our patients are unfavourably affected by the heat. From our own observations we have concluded that the most marked effect of the heat is a feeling of discomfort. The cool nights seem refreshing enough to counterbalance any ill-effects of this discomfort.

In any climate where there is cold weather during the winter, patients usually have a better appetite and gain more weight than during the summer. Most patients also make their greatest improvement during the cold weather. These facts have led to the conclusion that the air is more beneficial than warm air; but while this is true, all patients have not the power to react to the extreme cold. Quoting Pottinger:—"It is not the cold, regardless of degree, that proves beneficial, but the amount that will stim-

*Read at the Annual Meeting of the Canadian Tuberculosis Association, Montreal, May 15, 1925.

ulate the patient's cellular activity to overcome it, and still have reserve energy stored up to increase his resistance to the disease." Dry cold air is thought to be more beneficial than moist cold air, just as dry warm air is better than moist warm air. In the British Columbia dry belt the stimulating effects of dry cool air are to be had during the day in winter, and during the night throughout most of the entire year. The low temperature is never extreme, rarely going below zero, and usually little below freezing, so that our average for the coldest month as previously stated, is only a few degrees below freezing. Our winters are, therefore, cold enough to give the desired stimulating effect, without being too cold for advanced cases with lowered vitality.

As one hears considerable criticism of the dry belt, and its extreme temperatures, I would like to emphasize the fact that these extreme temperatures, either high or low, prevail for very short periods. Although the thermometer may register them as extreme, the individual does not feel them nearly so acutely as the lesser changes in so-called moderate climates, with high humidity.

Dry clean air is just as important a consideration in the treatment of tuberculosis as agreeable temperatures, and nowhere can it be found in greater abundance than in the dry belt with its high percentage of sunshine, sparse population, dry sandy soil, and small amount of vegetation. Low humidity tempers the effect of the changes in temperature. It also is responsible for fairly marked daily fluctuations of temperature because dry air does not retain heat so well as moist air. These fluctuations of temperature result in breezes which gives us almost constant air movement, considered by most writers as very important in the treatment of tuberculosis in any locality.

A low humidity seems to have a very beneficial effect on those patients with a marked bronchitis. One of the first facts that impresses a physician in treating tuberculosis in the dry belt, is that cough and expectoration are not the prominent symptoms they usually are elsewhere. Another important point we have observed is that seldom do patients complain of night sweats. Whether this is due to low humidity or to some other cause, I cannot say.

The value of sunlight as an agent in the

treatment of pulmonary tuberculosis has not been definitely determined. Various writers claim good results by different methods of exposure of the body. Many people, whether well or ill, find that their moods vary with the weather, and the psychological effect of sunshine is undoubtedly good. In a climate where there is little precipitation an occasional shower is refreshing and enhances the effect of the sunshine, yet when one is reasonably sure that it is not going to rain for the next three weeks or so, it is easier to arrange to take the cure in the open air, and one is likely to be in a more settled frame of mind. There are more hours of bright sunshine in the dry climate belt than at most points outside of it, and on most of the days which do not register bright sunshine there is low humidity. With the little likelihood of rain the weather cannot be called dull or depressing. At this point it might be well to mention that the records of humidity taken by the Meteorological Department in the dry belt are apt to be misleading, because the readings are taken only twice daily, and at the time of the day when the humidity is highest. At Tranquille we have had them taken every two hours for a short period and find that the mean relative humidity is much lower than when they are taken twice daily. The weather in the dry climate belt is not always ideal, there being times, particularly in the spring, when we have changeable weather for a short period.

We have no complete follow up system from which information necessary for a scientific paper on after-history could be obtained. However, a general idea of the after-history of patients treated in the dry belt might be formed from statistics compiled as a result of a questionnaire sent out to ex-patients of the Tranquille Sanatorium. This questionnaire was sent to all ex-patients who were discharged between the year 1911 and 1922, and whose present addresses we were reasonably sure of—about five hundred in all. Of these the postal authorities were unable to deliver sixty-seven, and two hundred and fourteen replies were received. Of these, ten were from the relatives of ex-patients who had died. In order to have an even number to work with four questionnaires containing the least information were discarded.

No attempt whatever was made to select from our records the names of patients in any par-

ticular group or classification; questionnaires were sent to all discharges, irrespective of the type or extent of their disease. The only point to which we paid particular attention was that a definite diagnosis of pulmonary tuberculosis had been made. When the replies were received corresponding case files showed the two hundred to be divided amongst the various classifications, as follows:—Incipient, or minimal, 63; Moderately advanced, 99; Far advanced, 38.

Considering the fact that during the greater part of the period covered by the years 1911-1922 advanced cases were not generally admitted for treatment, it will be seen that these ex-patients are fairly representative of the sanatorium admissions during that period.

Of the two hundred cases under review, fifty-two are now residing in the dry belt, and one hundred and forty-eight outside the dry belt. All of these cases have been able to do part, or full time work at some time since their discharge. At it would be impossible to check up each case from every angle to estimate the effect, if any, of climate, one clause in the questionnaire asked the patients to state whether they noticed any change in their own case. One hundred and thirty-two considered the wet climate affected them unfavourably; sixty-three noticed no effect; and five felt that they had been favourably affected by a change to the wet climate. The main reasons advanced by the one hundred and thirty-two for the opinions expressed by them were: increased cough and sputum, shortness of breath, and, in their own words: "a very noticeable lack of pep," after leaving the dry belt. Many who had been able to continue working for years stated that, although they were

able to keep going, they never felt so well outside the dry belt. These people continue under present conditions, not by choice, but because of the lack of opportunities for employment in the dry belt. Although there may be no sound medical reasons for accepting these opinions as conclusive evidence of any effect of climate, it would seem unwise to disregard them altogether, for, after all, the patients themselves know best how they feel.

The number of relapses amongst those ex-patients living in the dry belt, as compared with those living outside of it, is probably as interesting as any information we have obtained. The conditions on admission and discharge are about in the same proportion in the two groups. The number of these relapses under the headings of condition on admission and discharge is best seen from the chart prepared from the replies to our questionnaire. The totals of this chart show that relapses have occurred in 32.6 per cent. of those residing in the dry belt, and in 53.3 per cent. of those residing outside of it. From these figures it would not seem unreasonable to assume that all other conditions being equal climate is a factor which must not be disregarded entirely.

While treatment in a dry climate may be desirable—and some cases are undoubtedly benefited by it—the main fact must not be lost sight of, namely, that climate *per se* has little influence on the course of active pulmonary tuberculosis. Individualism should be the keynote in the treatment of all patients with pulmonary tuberculosis. No two patients of the same age, type, and class, present the same picture clinically or pathologically, although they may show the same

Condition on Admission	Condition on Discharge	Living In Dry Climate Belt		Living Outside Dry Climate Belt	
		Did not Relapse	Relapsed	Did not Relapse	Relapsed
Incipient or Minimal	App. Arrstd	10	1	22	9
	Quiescent.....	1	1	9	10
	Improved.....	..	..	..	..
Moderately Advanced	App. Arrstd	3	4	5	3
	Quiescent.....	12	8	19	26
	Improved.....	1	1	5	8
	Unimproved.....	..	..	1	3
Far Advanced	App. Arrstd.....	..	..	1	..
	Quiescent.....	7	2	6	13
	Improved.....	..	..	..	5
	Unimproved.....	1	..	1	2
Totals.....		35-67.4%	17-32.6%	69-46.7%	79-53.3%

amount of involvement. Types have to be differentiated and treated according to their needs. Were this fact universally recognized, practitioners would be less likely to allow their newly diagnosed patients to drift along at their work at a time when absolute rest was demanded. Neither would they do what is still worse, simply tell their patients to seek at once a dry climate, without any special instructions as to what they should or should not do, irrespective of the type of the disease the patient suffers from.

Every sanatorium cannot have all the advantages of climate. Many patients come to centres in the dry belt which enjoy a reputation for their equable climate, looking for the elusive light job to provide themselves with the necessities of life. These patients might have received scientific treatment in a sanatorium near

home with good results. A few of them may get well, but many are compelled to return home, discouraged and disillusioned, when it is probably too late for treatment to avail them much. It is the tale of blasted hopes, told by these disappointed people, that is largely responsible for adding numbers to the ranks of those who maintain that climate is not even a minor factor in the treatment of tuberculosis.

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THE EVALUATION OF TUBERCULOSIS LOSSES*

A. C. JOST, M.D.

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WHEREVER the vital statistics of a community are gathered there are available some data respecting tuberculosis, sufficient to permit some estimate to be made of the extent of the losses from which the community is suffering. It is the tritest of observations that the more complete the statistics are, the more valuable are the deductions which may be made from them.

It is well, however, in considering these statistics to call to mind several points which ought not to be disregarded. The Framingham experience and its margin of error may be recalled; when the statistics of that community were very carefully examined, the actual losses were considered to be about 15 per cent. greater than they appeared to be on first examination. This error is, as a rule, not due to error of diagnosis, but to other causes. By how much any individual community differs from Framingham in

that regard can only be told from a careful checking up of the statistics of that community.

Furthermore, it is advisable to remember that error in diagnosis is made with a frequency which is worth comment. The examination made by Cabot indicated that in a group of 3,000 cases this error amounted to about 59 per cent. in respect of pulmonary tuberculosis¹. The finding of this quite high percentage would appear to be in line with sanatorium experience, since each year an appreciable though varying number of cases are admitted to sanatoria, in whom the diagnosis is eventually revised. When we remember the large percentage of cases who do not at any time secure admission to sanatoria, it is conceivable that an appreciable number of cases go to a fatal termination without a revision of the finding.

The simplest method of evaluation is that given in the specific death rate, usually in terms of 100,000 of population. For ordinary purposes of comparison this is usually the only

*Annual meeting of the Canadian Tuberculosis Association, Montreal, May 14, 1925.

figure used, and subject to the limitations hereafter referred to, has a value which must be recognized.

Of more value for many purposes is the more detailed information obtained from rates according to variations of the disease itself, to sex and to age grouping. If reference is made to Nova Scotia figures, the ones easiest available for study by the writer, it will be seen that from these many deductions of considerable value are possible. The one which is apparently quite obvious is the fairly evident proof that our recent improvement in the statistics of this disease is confined entirely to an improvement in the pulmonary form of the disease. It must be remembered in this connection, however, that since the time when the gathering of these records were first attempted in this province, there have been at least two changes in disease nomenclature. The normal relationship between pulmonary tuberculosis and other forms of tuberculosis, is approximately about five to one. There appears, however, to be some limitation to that general statement owing to the fact that apparently at times there is either some doubt in the mind of the practitioner filling out the death certificate as to

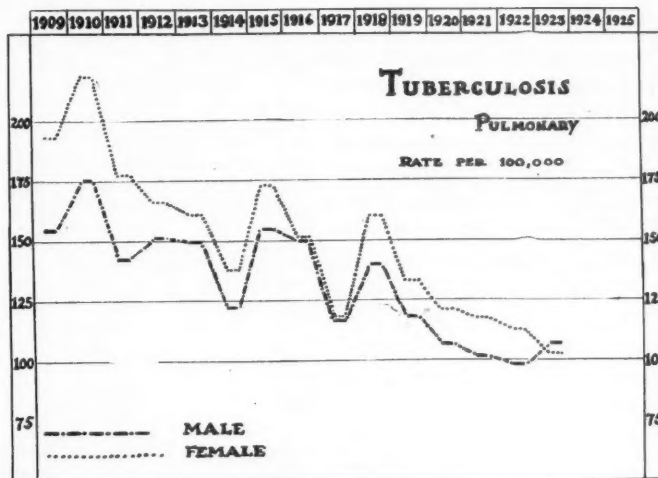


Chart 1. Tuberculosis Pulmonary, by sexes. The Nova Scotia experience appears similar to that of the Netherlands and Sweden for instance (where the female death rate exceeds the male) and is wholly different from the English experience (where the male rate is far the higher). This chart shows that much improvement has taken place.

whether the pulmonary lesion was the one to be stressed, or to a somewhat different procedure on the part of those tabulating the certificates. In point of theory I need not remind you that there now appears to be a very marked volume of opinion that pulmonary lesions are always secondary.

More information of value may be obtained from a consideration of the relationship between the deaths from tuberculosis and deaths from all causes occurring in the community. Under ordinary conditions, in a country of more or less

settled population, there is quite observable in recent years a decline in the general death rate. Has this decline in the general death rate been connected in any way with a lessening in the losses from tuberculosis? Is the improvement with respect to tuberculosis keeping pace with the general improvement, or is it surpassing it? In what age groups is improvement taking place? Are some stationary while the others are improving?

By reference to the Nova Scotia experience it will be seen that this latter appears to be the condition. In the age groups 5-9 and 10-14 tuberculosis deaths

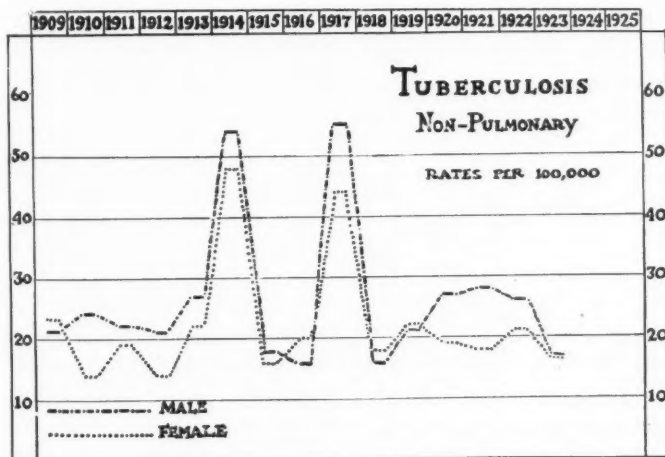


Chart 2. Tuberculosis Other Forms, by sexes, showing the tendency for the male rate to exceed the female. This chart indicates that little improvement has taken place.

now comprise a greater percentage of all deaths than was the case some time ago, while the decline in other age groups is quite well marked. The age groups showing improvement, it will be noted, are especially the sanatorium age groups. Has this no significance? It is quite significant, too, that there has been an improvement in the age group 0-5, probably largely an accompaniment of the improvement in the provincial infant mortality rates.

All crude death rates, it must be remembered, are derived from two figures. It is sometimes forgotten that they are therefore reflective of both these figures, not of one alone. They reflect not only the deaths but the population. The process of standardizing a death rate is one, so to speak, of smoothing out the irregularities of the population, so that the resulting figures represent more accurately the deaths alone. If you read the latest report of the Bureau of Statistics you will find standardized general death rates of the provinces in the Canadian

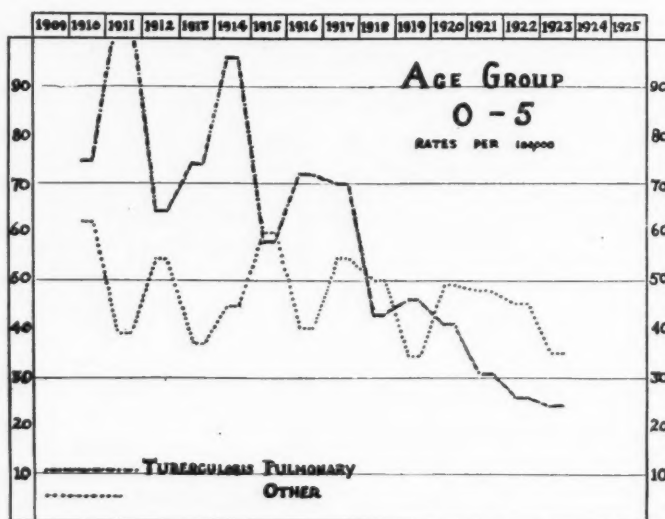


Chart 3. Tuberculosis by Age Groups—Ages 0-5. Great improvement in respect of Pulmonary Tuberculosis; little in respect of Tuberculosis Other Forms.

Registration Area standardized according to the direct method.

In a similar way it is possible to standardize the tuberculosis death rate, by considering the deaths by age groups against the age groups of some population taken as a standard. The computation here given follows Sir Arthur Newsholme's method, and is used to standardize the

Nova Scotia rate against a standard obtained from a million of the population of Canada as a whole according to the 1921 census. It will be seen that the effect of standardizing Nova Scotia's rate against that standard reduces the actual rate by only an inappreciable amount, differing in this respect from the standardizing of the general death rate against the English standard which diminishes the crude Nova Scotia rate by about 12 per cent. This reduction is due to the unusual nature of Nova Scotia's population. The effect of standardizing the rates of the other provinces, using always the same standard, is shown in Table II. This process is of interest mainly for comparison of rates from several

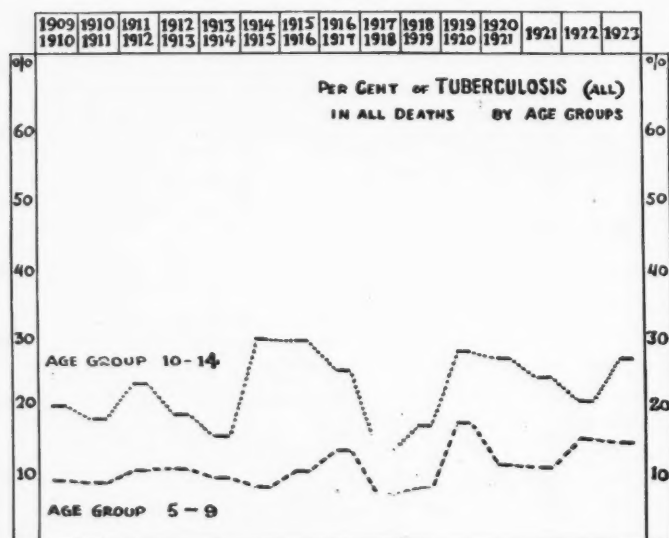


Chart 4. Per cent. of Tuberculosis Deaths in all Deaths by Age Groups. In these groups the percentage of tuberculosis deaths is becoming higher, indicating that improvement in respect of tuberculosis is here not keeping pace with the improvement in the general death rate.

countries, and I need not tell you that it is immaterial what population is used as a standard. If we are told that one town is ten miles from a certain point and another one fifteen, it makes no difference what length is understood by the word mile in our concept of relative distance.

In other ways the method is of little value. It fails, for example, to bring out the relative loss due to unusual conditions of population. For instance Nova Scotia has unfortunately a population sadly depleted of persons between the age groups 19-44, which are precisely those age groups which tuberculosis mainly affects. The bulk of the tuberculosis loss, therefore, falls on age groups already thinned by emigration. From an economic point of view, tuberculosis, therefore, must mean more to our province than it would mean to a province which has, if anything, a relative excess of persons in that group. The method of standardizing the death rate in no way brings out this effect, nor

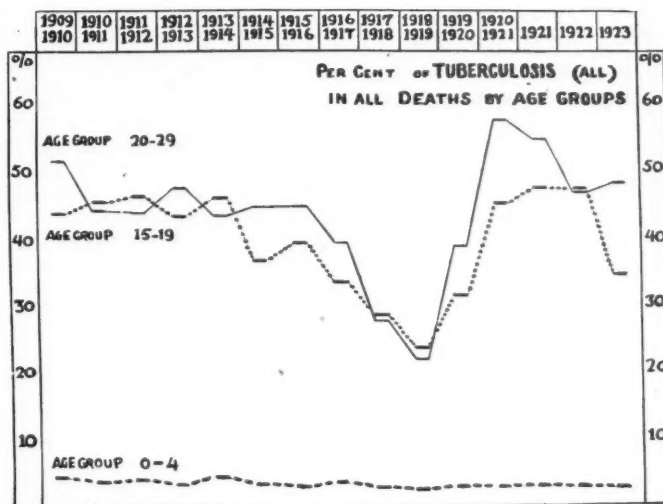


Chart 5. Per cent. of Tuberculosis Deaths in all Deaths by Age Groups. In these groups, improvement in respect of tuberculosis is outstripping the improvement in the general death rate. The great fall observable about the year 1918 is due to the great number of deaths from influenza which particularly affected persons of the central age groups.

do I at present know of any method by which that relative value may be estimated.

Perhaps the best method of estimating tuberculosis losses or the losses of any disease is that of computing the result that the presence or absence of the disease has on the expectation of life. Such a study has been undertaken for the Metropolitan

Life Assurance policyholders, by Dr. L. I. Dublin. Here again recourse is had to Nova Scotian figures in order to illustrate the method followed. If a life table be constructed by the short method from the 23,212 deaths occurring in the years 1919, 1920, and 1921, it is possible to obtain the group expectancies of life by age groups from age 0 to 100. During the period under consideration there were in the province 2,358 deaths from tuberculosis in all ages. If this number be taken from the total number of deaths above given, and the resulting figure corrected for those of the 2,358 who at

TABLE I.
NOVA SCOTIA
1921
TUBERCULOSIS (ALL FORMS) STANDARDIZED RATE

AGE	LIVES AT RISK	IS TO	STANDARD	AS	DEATHS	ARE TO	RESULT
0-4	60445	IS TO	120640	AS	47	ARE TO	93.805
5-9	59915	-	119627	-	14	-	27.952
10-14	57312	-	104156	-	24	-	43.616
15-19	51901	-	91457	-	83	-	146.258
20-24	43817	-	81122	-	127	-	235.125
25-29	38243	-	78307	-	96	-	196.576
30-34	63777	-	146603	-	94	-	216.076
35-39	54081	-	109746	-	71	-	144.079
40-44	40065	-	73255	-	61	-	111.532
45-49	29508	-	46908	-	51	-	81.073
50-54	17450	-	21532	-	29	-	35.783
55-59	7324	-	6647	-	5	-	4.537
	523857		1000000		702		1336.—

RATE PER 100000 CRUDE 1340

RATE PER 100000 STANDARDIZED 1336

STANDARD CANADA CENSUS 1921

the prevailing rates of mortality might have been expected to die, it is then possible to construct another life table which shows what the life expectancy would have been had tuberculosis not been present. From the census population of the year 1921 by age groups, and these group expectations, a very simple multiplication and addition gives the total number of years which the whole population might reasonably be expected to live under the various conditions, that is, both in

the presence of tuberculosis and in its absence.

It will be seen that according to this computation, the presence of tuberculosis means for the year 1921, a reduction of about 1,000,000 years

TABLE II.
TUBERCULOSIS

PROVINCE	RATES (100000)	
	CRUDE	STANDARDIZED
NOVA SCOTIA	134.0	133.6
NEW BRUNSWICK	106.4	109.2
PRINCE EDWARD ISLAND	144.4	140.5
QUEBEC		
ONTARIO	71.0	68.4
MANITOBA	68.8	70.6
SASKATCHEWAN	42.5	45.5
ALBERTA	53.1	53.7
BRITISH COLUMBIA	77.7	72.1

STANDARD CANADA GENERAL 1921

of life, or an average of two years of life capital distributed among the 500,000 persons in the province. If, as Dr. Dublin estimates, a year of life ought to represent a valuation of approxi-

TABLE III.

NOVA SCOTIA LIFE TABLE

1919-20-21

AGE	POPULATION	TUBERCULOSIS PRESENT			TUBERCULOSIS ABSENT		
		DEATHS	RATE	Px (Log)	DEATHS	RATE	Px (Log)
0-4	180700	5770	31.93	7.9227220	5644	31.23	7.9322015
5-9	178254	559	3.13	7.9932235	497	2.78	7.9939635
10-14	169939	375	2.20	7.9952230	291	1.71	7.9963090
15-19	155105	874	5.60	7.9880570	595	3.83	7.9917050
20-24	135383	1080	7.97	7.9827155	733	5.41	7.9882740
25-29	110241	961	8.71	7.9811085	629	5.70	7.9876230
30-34	97163	867	8.92	7.9806305	665	6.84	7.9851475
35-39	93007	795	8.54	7.9814560	618	6.64	7.9855815
40-44	85723	701	8.17	7.9822810	565	6.59	7.9857120
45-49	74050	620	8.37	7.9818415	503	6.79	7.9852775
50-54	63503	689	10.84	7.9764610	602	9.47	7.9795015
55-59	55000	897	16.30	7.9646045	813	14.78	7.9679050
60-64	47644	1005	21.09	7.9422335	920	19.30	7.9580895
65-69	40736	1274	31.27	7.9319580	1191	29.23	7.9365455
70-74	31573	1676	53.08	7.8847115	1631	51.65	7.8878405
75-79	20471	1736	84.80	7.8157505	1703	83.19	7.8192725
80-84	12468	1531	122.79	7.7330315	1525	122.31	7.7340975
85-89	6744	1128	167.25	7.6359490	1126	166.96	7.6366055
90-94	1518	353	232.54	7.4927510	354	233.20	7.4912990
95-99	790	279	353.16	7.2250895	280	354.43	7.2221750
100-104	102	58	568.62	7.7302745	58	568.62	7.7302750
105+	5	4	800.00	7.1601165	4	800.00	7.1601165

TABLE IV.
—LOSS OF LIFE CAPITAL DUE TO TUBERCULOSIS (All forms).
NOVA SCOTIA.

Age	Population 1921 Census	After Lifetime Tuberculosis Present	After Lifetime Tuberculosis Absent	Difference	Life Capital Tuberculosis Present	Life Capital Tuberculosis Absent
0	60,395	55.81	58.83	3.02	3370644	3553037
5	59,866	55.75	58.88	3.13	3337529	3524910
10	57,265	51.49	54.54	3.05	2948574	3123233
15	51,859	47.43	50.26	2.83	2459672	2606433
20	43,781	43.95	46.37	2.42	1924174	2030124
25	38,211	40.71	42.60	1.89	1555569	1627788
30	31,975	37.44	38.87	1.43	1197144	1242868
35	31,748	34.00	35.12	1.12	1079432	1114989
40	27,938	30.35	31.22	.87	847918	872224
45	26,099	26.53	27.19	.66	692406	709631
50	22,426	22.69	23.17	.48	508845	519610
55	17,607	19.08	19.43	.35	335941	342104
60	16,350	15.67	15.96	.29	256204	260946
65	13,133	12.46	12.63	.17	163637	165869
70	10,061	9.68	9.77	.09	97390	98295
75	7,376	7.52	7.56	.04	55467	55762
80	4,443	5.89	5.89	—	26169	26169
85	2,055	4.55	4.55	—	9350	9350
90	629	3.36	3.36	—	2113	2113
95	156	2.22	2.22	—	346	346
100	37	1.07	1.07	—	109	109
Totals...	523,410				20868633	21885910

Average Life Capital, Tuberculosis Present 39.87 years
“ “ “ “ Absent 41.81 “

mately \$100.00 to the state or province, this represents roughly \$100,000,000 which the disease is costing the province in reduction of life capital alone. The amount which all organizations are at the present time spending to prevent

or diminish the loss sinks into insignificance when compared with such a sum as this.

REFERENCE

(1) CABOT, *Journal Amer. Med. Assn.*, Dec. 28, 1912.

Cosmetics.—H. E. Miller and L. R. Taussig, San Francisco, mention the components of the cosmetics commonly employed, and give in some detail an account of skin eruptions due to their use that have not previously been reported in the literature. They describe dermatoses due to face powder, rouge, lip stick, hair dye, wrinkle remover and nail polish and give, when possible, the component responsible for the eruption. The authors believe that sufficient emphasis has not been placed on the usual components of cosmetics and the dermatoses that they may provoke. Many of the so-called eczemas in women, if carefully investigated, will be found to be cases of dermatitis venenata due to cosmetics. The anilin dye used as coloring matter in the bizarre tints of face powder, rouge and lip stick may cause a definite dermatitis. Hair dyes con-

taining the vegetable pigments are seldom harmful, while those containing the minerals or anilin products may cause skin eruptions or general ill health. The attempted removal of wrinkles by applying phenol to large areas of the skin surface may cause considerable facial deformity and even death. A dermatitis on the sides of the neck in women may be due to irritation from recently applied liquid nail polish that comes in contact with the neck when the patient sleeps with the hands under the face. Legislation should be enacted prohibiting the use of the anilin dyes in the manufacture of cosmetics, and the application of phenol for the removal of wrinkles by unlicensed charlatans and beauty specialists.—*Jour. A. M. A.*, June 27, 1925.

THE RÔLE OF THE ULTRA-VIOLET RAY IN THE TREATMENT OF TUBERCULOSIS*

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Montreal

THE ultra-violet ray has quite recently become a byword in the treatment of tuberculosis and bids fair by its popularity to become fashionable and when it attains that distinction it will probably be used indiscriminately and later depart into the pathetic limbo of discarded fashionable things.

It is just because of this danger that a gathering such as this should consider its uses and limitations, both in the prevention and the cure of tuberculosis. However, it must not be forgotten that its application is not limited to tuberculosis for it was in the treatment of rickets and tetany that it passed from an empirical stage on to sound scientific ground. In these diseases it has been shown over and over again, by chemical examinations, to raise the lowered calcium and phosphorus content of the blood to within normal limits.

Herodotus and Hippocrates mention the value of sunlight in their writings. The ancient Egyptians worshipped their sun-god. The Greeks and Romans built solaria in their homes and on their terraces. Unfortunately during the middle ages religious fervor focussed men's attention in another direction, consequently no thought seems to have been given to heliotherapy until about 1800. In 1801 Ritter reported the action of ultra-violet rays upon silver chloride. In 1818 Grotthus formulated his law "only the rays absorbed are effective in producing chemical change." About 1840, Ollier and Poncet, of Lyons, published their observations on the treatment of tuberculous arthritis with sunlight. In 1893, Finsen, of Copenhagen, began to publish the results obtained by his treatment of lupus with the ultra-violet ray from the carbon arc lamp. In 1902, Bernard, of St. Moritz, began treating suppurating wounds in the sunlight and in 1903, Rollier at Leysin began treating his tuberculous cases in the same way. Recently I

had an opportunity of visiting his clinic and I am filled with admiration for the great work that he is accomplishing at Leysin. Rollier was unquestionably the first to advocate the general sun bath as distinct from the local application of sunlight. Rollier obtained ultra-violet ray from its direct and natural source. In all climates and all places this is not possible.

Fortunately these rays can be produced artificially by means of the carbon-arc lamp or the mercury vapor lamp. *Glass which may intervene between the source of light and the patient deflects most important rays.* In the case of the carbon-arc lamp this feature is of no particular importance; but, in the mercury vapor lamp quartz must be substituted for glass as a receptacle for the mercury. At the Finsen Institute in Copenhagen light from the carbon-arc is most successfully used for the treatment of skin, bone, and lymph tuberculosis, and there it is claimed that the carbon-arc lamp is more satisfactory than the mercury vapor lamp for the reason that it is said to produce a more penetrating ray. The exponents of the mercury vapor lamp claim that their lamp is richer in ultra-violet radiation than the carbon-arc. However, no definite evidence has been brought forward, and to date, for all practical purposes, the effect of treatment by the two lamps seems to be identical.

All artificial methods for producing ultra-violet rays are an attempt to simulate solar rays under the sun's most favourable circumstances. Fortunately the sun is at the disposal of all of us for a part of the year, and during the season that it is impossible to utilize heliotherapy many of us can employ the mercury vapor or the carbon-arc lamp. The mercury vapor lamp is now being produced by several firms. It is simple to operate.

Certain conclusions have been arrived at in heliotherapy from meteorologic measurements

*Read before the Annual Meeting of the Canadian Tuberculosis Association, Montreal, May 15, 1925.

which have been summarized by Rosselet in the following manner:

I. Direct light:

A. At a given place (plain or high altitude):

- (a) The intensity of the different portions of the solar spectrum is approximately the same in summer.
- (b) The differences between these partial intensities increase as winter is approached. The shorter the wave-length under consideration, the more marked is this seasonal variation. The winter sun is poor in ultra-violet rays.

B. The difference between high and low altitudes:

- (a) In summer the intensity of the different radiations is approximately the same at high and low altitudes.
- (b) In winter the value of this intensity diminishes, but at high altitudes to a less extent than in low country. This comparatively small degree of seasonal difference in the intensity of the solar radiations is an important characteristic of the climate of high altitudes. As a result of this fact, the intensity of solar radiation is more equable throughout the year in high altitudes than in low country, and heliotherapy may be practised there in all months of the year.

These facts show that heliotherapy, considered solely from the point of view of solar radiations, may in summer be practised in low country just as well as at high altitudes. In this season the advantages of the mountain air are to be looked for in the cool, dry, bracing quality of its air, comparing favourably with that of the plain, which is apt to be warm and moist and to have an enervating action which may counteract the good effects of the treatment. Sea air has, in summer, great advantages over inland air.

Physiology.—How light produces its therapeutic effect has not yet been determined; but, this problem is engaging the attention of many investigators all over the world, and we may confidently expect some results before many years. Downes and Blunt¹ in 1877 proved the bactericidal power of light by the following experiment: Culture-tubes were divided into two lots, the first consisting only of plain tubes, while in the second the tubes were surrounded by a sheet of lead foil which would prevent the action of light without interfering with that of heat. When exposed to light for a given time it was found that only in the tubes surrounded by lead had the germs developed. It was also shown that light had not modified the culture-medium in the tubes which had remained sterile, as subsequent inoculation of these resulted in abundant cultures. *Since then numerous other workers have investigated this problem, and*

to-day opinions are united in recognizing the powerful bactericidal power of the ultra-violet group of radiation.

The question of penetration of ultra-violet rays is still undecided. Leonard Hill² in 1920 demonstrated the repeated absorption of the radiations of short wave-lengths by the integument, and that the possibility of deep penetration must be looked for among the radiations of greater wave-lengths. Although the direct action of light is often disputed, this is not the case with the indirect action, which is universally accepted. In 1914 Guie³ reported the case of a child suffering from tuberculosis of the tracheobronchial glands who tolerated moderate sun treatment very well on the feet and legs. The mother, on her own initiative, doubled the duration of insolation. The change was followed by a severe cough, rise in temperature, and all other symptoms which characterize the reaction of a glandular lesion in this locality.

The rôle of pigmentation is still uncertain. Its appearance coincides with the action of substances which irritate the skin. Certain writers have recorded pigmentation as harmful in ultra-violet therapy on account of interference with the penetration of radiations. Clinically, this does not seem to be borne out, as pigmentation is almost a therapeutic index of cure. Possibly pigmentation may materially help by protecting the body from too great heat; or again, pigmentation may act in a similar manner to fluorescent substances.

Exactly what rôle fluorescent substances play in light therapy has not yet been determined. Many investigators are concerning themselves with this problem and some results have been obtained in the study of rickets. The demonstration by Huldshinsky and others that radiation with the mercury vapor lamp or sunlight prevented and cured rickets, was a great advance in the knowledge of that disease. It had been proved also that cod liver oil prevents and cures rickets, and therefore the dilemma presented itself that therapeutic agents apparently unrelated cure the disease. The one, a physical force derived from the sun is absorbed through the skin, the other, an oil taken from the liver of a fish, enters the body by way of the alimentary tract. Nevertheless, investigation soon showed that in their action in rickets and infantile tetany the actinic ray and cod liver

oil are indistinguishable. No matter which of these apparently dissimilar therapeutic agents is employed, favourable clinical, chemical, and roentgenological evidence of healing in rachitic subjects are demonstrable. With both there is a similar latent period; with both the normal equilibrium of calcium and inorganic phosphorus of the blood is re-established; and furthermore, with both, the histological changes in the skeleton are identical. The similarity of the action of radiant energy and cod liver oil is so striking as to cause Parks, Powers, and Guy to conclude:—"The similarity between the action of cod liver oil and that of radiant energy in rickets is so close that a connection must exist between them. So far as the calcium and phosphorus metabolism of the body are concerned, cod liver oil seems to be a substitute for radiant energy. It will be most interesting to see if, in the near future, a relation between cod liver oil and radiant energy will not be established of such nature that these effects will be explainable on a single basis."


The action of light on blood-cells has been the subject of many investigations. Unfortunately, the evidence is conflicting and no definite conclusions can be made. In many cases blood changes may be due to the beneficial action of light therapy on the general health rather than to any action of the ultra-violet rays on the hematopoietic system.

Treatment by light.—From the foregoing remarks it will be readily understood that the technique of applying light is extremely important. One is too ready to assume that light therapy is a simple, common-sense matter which any fool can apply. This is very far from being the case, and in all probability many have lost faith in ultra-violet therapy on account of failure to appreciate this point. All cases treated at Leysin by heliotherapy are kept under observation indoors for at least forty-eight hours before receiving insolation, and on the first day of treatment they are allowed only five minutes' exposure to the solar rays. The insolation is gradually increased until three hours daily is being received. It has been found that more than three hours' insolation is unnecessary, and even in some cases harmful.

The following extract from Rollier's⁴ textbook gives a good idea of how to employ heliotherapy:—

Technique of the sun-bath.—The technique we have finally adopted for the sun-bath has been evolved during a number of years of experience, and is the one which we have found empirically to be the safest; this method consists in beginning always with the feet and insulating both legs and arms before exposing the abdomen and thorax. By this means we are able to get a general idea of the tolerance of the patient to sunlight before the more vulnerable parts of the body are exposed; any accidents which result are, therefore, of a slight nature, and as they only affect outlying regions of the body, their general effects are likely to be minimal. The thoracic and abdominal viscera are not subjected to any congestion, but rather to a decongestive action, as insolation of the extremities causes the blood to flow to these regions and therefore away from the viscera.

We must also emphasize the importance of using short periods of insolation (ten to fifteen minutes), alternating with periods of rest (five to ten minutes). These short periods of rest enable the body to tolerate a much greater total amount of sunlight than would be possible with one long sun-bath, which is much more fatiguing to the patient, besides being more irritating to the skin. We find that a series of moderate reactions three or four times a day (ten to fifteen minutes) is more beneficial and causes more rapid acclimatization than is the case with a single period of thirty minutes. The vasomotor system of the skin covering those parts of the body usually under the clothes is much less developed than that of the exposed parts, and reaction to stimulation is comparatively lethargic; by exposing the skin of these regions several times a day this vasomotor reaction is called into play and with use takes place with greater facility. The skin, subcutaneous tissues, and muscles are much benefited by this improved circulation, and their development, especially that of the muscles, is very considerable. With patients suffering from visceral or pulmonary tuberculosis the necessity for this method of insolation is particularly great, as serious accidents may follow the congestion produced by faulty technique.



DAYS	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th
Head/Neck										
Torso					5"	10"	15"	20"	25"	30"
Legs				5"	10"	15"	20"	25"	30"	35"
Feet		5"	10"	15"	20"	25"	30"	35"	40"	45"
Feet (continued)	5"	10"	15"	20"	25"	30"	35"	40"	45"	50"

The diagram shows the usual progression in a normal case; it does not represent a hard-and-fast rule, as we have here to take account of so many all-important and variable factors, such as general condition of the patient, localization and character of the lesion, and tolerance to sunlight, and besides these we must allow for various atmospheric conditions, e.g., temperature and movement of the air, height of sun, and clearness of atmosphere.

Under the average conditions assumed in the diagram, the feet are uncovered on the first day three times for five minutes, on the second day three

times for ten minutes, and on the third day three times for fifteen minutes, and so on. On the second day the legs are exposed at the same time as the feet, but only for five minutes; on the third day the thighs are similarly uncovered for five minutes, while the legs have ten minutes and the feet fifteen.

On the fifth day, for example, the patient will have, at ten-minute intervals, three sun-baths of twenty-five minutes' duration, uncovering first the feet, and then, at five-minute intervals and in the following order, the legs, thighs, abdomen, and thorax. In cases complicated with pulmonary tuberculosis even slower progress is necessary. Where there is any cardiac disease or simply tachycardia, a white cloth should be placed over the cardiac region. The head and nape of the neck should always be protected by a white linen hat, which should, if possible, be lined with green gauze, as this is more restful to the eyes than white. Smoked, dark yellow, or black glasses should also be used to protect the eyes.

If all goes well for ten days or so, the periods of insolation may be lengthened and reduced to two or three in number; by this time any idiosyncracies of the patient will have been discovered and a fairly accurate estimate of his tolerance to sunlight formed; it will, therefore, be possible to hurry on the treatment with some patients while continuing cautiously with others. The duration of the sun-bath must also depend on the rate at which pigmentation takes place; where there is early pigmentation rapid advance may be made, while with patients whose skin reddens rather than browns there is danger of erythema, and caution is necessary. If for any reason the patient has had to interrupt treatment before he is properly pigmented, a start must be made several stages behind the previous maximum.

When once the skin is well pigmented all over the body there is no longer any danger of over exposure, and the patient may have several hours of sun-cure every day. Three hours a day is for the majority of people the most suitable amount of exposure to sunlight; indications to exceed this only exist in young persons whose bodies adapt themselves easily to their new surroundings and who pigment well. As a general rule sun-baths should be of shorter duration in summer than in winter, as in the former season the temperature of the air being itself comparatively high the additional heat of the sun is not so well tolerated.

All forms of tuberculosis except pulmonary and meningeal are greatly improved by ultra-violet therapy. In active pulmonary tuberculosis and in tuberculous meningitis ultra-violet

therapy is contraindicated. Bone tuberculosis, skin tuberculosis, tuberculous adenitis, tuberculous peritonitis, and pleurisy with effusion are among the forms most successfully treated. In the absence of heliotherapy, ultra-violet radiations from either the carbon-arc or the mercury vapor lamp is the logical substitute; but, with artificial ultra-violet therapy, *fresh air* must be an important adjunct of the treatment. If it is felt in institutions particularly interested that heliotherapy itself must be applied, quartz window-panes may be substituted for glass and certain firms in the United States are now advocating their adoption in hospitals, sanatoria, etc., and it seems to me there is something to be said in favour of their adoption; for, after all, pure sunlight and fresh air are the real things which artificial phototherapy is trying to imitate—and ignorance and greed may combine to form a so-called substitute for the ultra-violet ray which the superstitious and gullible public will accept as the real thing. The real use of these lamps, then, is to "carry on" when and where we cannot have sunlight.

And finally, one word regarding prevention. The old saying that one ounce of prevention is worth a pound of cure is a thousandfold true; for, proper living, proper eating, proper sleeping, proper fresh air, and ultra-violet ray would almost free the world of tuberculosis.

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Puerperal Fever.—Abraham F. Lash and Bertha Kaplan, Chicago, state that the filtrate derived from the blood broth culture of the hæmolytic streptococcus isolated from the blood of patients with puerperal septicemia produced inflammatory reactions, which began within from six to twelve hours after intracutaneous injection, and persisted for from thirty-six to forty-eight hours. The degree of reaction varied with the concentration of the filtrate, and the incidence varied with the concentration and the

state of the patient. In nonpregnant women, infection free, 10 per cent. showed reaction; in pregnant women, 15 per cent. In the noninfective puerperal women, reactions occurred in 72 per cent. with Strain B and in 44 per cent. with Strain C, while in the septic puerperal women using the same dilutions as in the normal, reactions developed in 21 per cent. with the Strain B filtrate and in 10.5 per cent. with the Strain C filtrate.—*Jour. A. M. A.*, June 27, 1925.

RESULTS OF ARTIFICIAL PNEUMOTHORAX TREATMENT AT THE MUSKOKA INSTITUTIONS OF THE NATIONAL SANITARIUM ASSOCIATION*

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FROM 1914 to March, 1925, treatment has been attempted in 443 cases. Of these, 331 received complete, partial satisfactory, or unsatisfactory compressions, and in 112 the pleural space has proven to be totally inaccessible. See Table I.

A *complete compression* has been considered as one in which the lung may show a few adhesions but at the same time one in which the physical and roentgenographic evidence indicates a complete suspension of its function of aeration. A *partial satisfactory compression* is one in which the greater part of the pulmonary parenchyma is thrown out of function, the influence of the compression being marked chiefly on the parts most badly diseased. An *unsatisfactory compression* is one in which there appears to be no appreciable restraint on the function of aeration. In the "*no compression*" cases there is either no evidence of gas in the pleural space or nothing but a small air pocket can be made.

To demonstrate the value of pneumothorax treatment, the "*no compression*" cases are used as the most suitable controls. These patients show essentially the same type of cases as those in whom compression was obtained. With very few exceptions, all have been cases whose prognosis was definitely unfavourable or at least shrouded in doubt. See Tables II and III.

This shows an increase on the side of favourable prognosis of 30 per cent. in all cases able to receive any treatment at all.

But those cases listed as "*treated*" include sixty-eight patients whose compression was unsatisfactory: that is to say, their compressions were of such limited extent and the treatment of such short duration, that the mechanical effect of the therapy was a negligible factor in the progress

of the case. (It will be shown later that the results in those cases are identical with the results in the "*no compressions*"). To show the results of therapeutic degree of compression in proper perspective, the cases of *unsatisfactory compression* are now listed with those of *no compression*:— See Tables IV and V.

This shows an increase of 37 per cent on the side of favourable prognosis in those who were able to receive gas in therapeutic quantities. In other words, without artificial pneumothorax an average case had twenty-nine chances out of 100, of improvement. Upon receiving the treatment, his chances increase to sixty-six.

These figures are further modified (in a way that it is impossible to show in statistics) by the fact that of those who received treatment and ultimately failed or died, sixty or 43.5 per cent. showed a temporary gain with abatement of symptoms and with life evidently prolonged to a variable degree. Tables IV and V show best the ultimate results of therapeutic compression.

The effect of the degree of compression obtained is shown in:—Tables VI and VII.

Showing almost identical results in the cases of "*no compression*" and the unsatisfactory compression cases; showing, on the contrary, an increase on the side of favorable prognosis of over 50 per cent. in cases of complete compression and of 30 per cent. in cases of partial satisfactory compression.

Table VIII shows the influence of extent of disease on results. This is summarized in Table IX. The treated cases include unsatisfactory compressions. A relatively small number of minimal cases have been attempted, twenty-six out of 433. Of the twenty-one whose pleural space has been accessible to some degree, 76 per cent. have shown improvement contrasted with 40 per cent. in the controls. Of the moderately advanced type, 66 per cent. of the treated cases and 35 per cent. of the controls have shown

*The classification of the American National Tuberculosis Association is used throughout this article.

The percentages detailed are within 0.5 per cent. of the absolute figures.

TABLE I

Treated.....	331	74.5%	Complete compression.....	99	22.5%
			Partial satisfactory.....	164	37.0%
			Unsatisfactory.....	68	15.0%
No compression.....	112		No compression.....	112	25.5%
	443			443	

In Table II, the ultimate results in all cases of compression—complete, partial, satisfactory or unsatisfactory—are contrasted with those obtained by general treatment in "No compression" cases.

TABLE II

	<i>Treated</i>		<i>No compression</i>	
Apparent cure.....	18	5.5%	0	0.0%
Arrest.....	37	11.0%	3	2.5%
Apparent arrest.....	34	10.5%	1	1.0%
Quiescent.....	34	10.5%	10	9.0%
Improved.....	70	21.0%	18	16.0%
Unimproved.....	20	6.0%	24	21.5%
Died.....	118	35.5%	56	50.0%
	331		112	

Summarized on the basis of improvement or non-improvement, the contrast is increased:—

TABLE III

Improved, etc.....	193	58.5%	32	28.5%
Unimproved.....	138	41.5%	80	71.5%
	331		112	

TABLE IV

	<i>Therapeutic compression</i>		<i>Unsatisfactory and no compression</i>	
Apparent cure.....	18	7.0%	0	0.0%
Arrest.....	35	13.5%	5	3.0%
Apparent arrest.....	32	12.0%	3	1.5%
Quiescent.....	34	13.0%	10	5.5%
Improved.....	54	20.5%	34	19.0%
Unimproved.....	16	6.0%	28	15.5%
Died.....	74	28.0%	100	55.5%
	263		180	

Summarized on the basis of improvement or non-improvement:—

TABLE V

	<i>Therapeutic compression</i>		<i>Unsatisfactory and no compression</i>	
Improved, etc.....	173	66.0%	52	29.0%
Unimproved, etc.....	90	34.0%	128	71.0%
	263		180	

TABLE VI

	<i>Complete</i>		<i>Partial</i>		<i>Unsatisfactory</i>		<i>No compression</i>	
Apparent cure.....	10	10.0%	8	5.0%	0	0.0%	0	0.0%
Arrest.....	19	19.5%	16	10.0%	2	3.0%	3	2.5%
Apparent arrest.....	19	19.5%	13	8.0%	2	3.0%	1	1.0%
Quiescent.....	15	15.0%	19	11.5%	0	0.0%	10	9.0%
Improved.....	16	16.0%	38	23.0%	16	23.5%	18	16.0%
Unimproved.....	3	3.0%	13	8.0%	4	6.0%	24	21.5%
Died.....	17	17.0%	57	34.5%	44	64.5%	56	50.0%
	99		164		68		112	

Summarized on the basis of improvement or non-improvement:—

TABLE VII

	<i>Completely compressed</i>		<i>Partial satisfactory</i>		<i>Unsatisfactory</i>		<i>No compression</i>	
Improved, etc.....	79	80.0%	94	57.5%	20	29.5%	32	28.5%
Unimproved, etc.....	20	20.0%	70	42.5%	48	70.5%	90	71.5%

improvement. In the far advanced type 43 per cent. have shown improvement, contrasted with 22 per cent. of this class in the controls and 28 per cent. of all "no compression" cases.

See Tables X and XI.

Table X shows the influence of the acuteness of disease, expressed in degree of toxic symptoms, on the results. This is summarized in

Table XI and indicates, of course, that prognosis is better where the toxæmia is of light degree, showing 66.5 per cent. improvement in this type, 58.5 per cent. improvement in the moderately severe type and 42 per cent. in the most severe types.

The improvement of 66.5 per cent. in cases mildly toxic contrasts with 44.0 per cent im-

TABLE VIII

	MINIMAL				MODERATELY ADVANCED				ADVANCED				ALL	
	Treated	No compression			Treated	No compression			Treated	No compression			No compression	
Apparent cure.....	1	5.0%	0	0.0%	8	4.0%	0	0.0%	9	7.0%	0	0.0%	0.0%	
Arrest.....	3	14.0%	0	0.0%	25	13.0%	2	4.0%	9	7.0%	1	2.0%	2.5%	
Apparent arrest.....	4	19.0%	0	0.0%	20	11.0%	1	2.0%	10	8.0%	0	0.0%	1.0%	
Quiescent.....	3	14.0%	1	20.0%	22	12.0%	5	9.0%	9	7.0%	4	8.0%	9.0%	
Improved.....	5	24.0%	1	20.0%	48	26.0%	11	20.0%	17	14.0%	6	12.0%	16.0%	
Unimproved.....	1	5.0%	0	0.0%	14	7.0%	14	25.0%	5	4.0%	10	18.0%	21.5%	
Died.....	4	19.0%	3	60.0%	51	27.0%	22	40.0%	63	53.0%	31	60.0%	50.0%	
	21		5		188		55		122		52			

Summarized on the basis of improvement or non-improvement:—

TABLE IX

	MINIMAL				MODERATELY ADVANCED				ADVANCED				ALL	
	Treated	No compression			Treated	No compression			Treated	No compression	No compression		No compression	
Improved, etc.....	16	76.0%	2	40.0%	123	66.0%	19	35.0%	54	43.0%	11	22.0%	28.5%	
Unimproved.....	5	24.0%	3	60.0%	65	34.0%	36	65.0%	68	57.0%	41	78.0%	71.5%	

TABLE X

	Degree of Toxic Symptoms				Degree of Toxic Symptoms				Degree of Toxic Symptoms				ALL	
	LIGHT		MODERATE		SEVERE		ALL		LIGHT		MODERATE		SEVERE	
	Treated	No compression	Treated	No compression	Treated	No compression	Treated	No compression	Treated	No compression	Treated	No compression	Treated	No compression
Apparent cure.....	6	6.0%	0	0.0%	7	3.5%	0	0.0%	5	10.0%	0	0.0%	0.0%	
Arrest.....	14	16.0%	1	4.0%	20	10.5%	2	2.5%	3	6.0%	0	0.0%	2.5%	
Apparent arrest.....	13	14.0%	0	0.0%	19	10.0%	1	1.5%	2	4.0%	0	0.0%	1.0%	
Quiescent.....	10	10.5%	2	8.0%	22	12.0%	7	10.0%	2	4.0%	1	6.0%	9.0%	
Improved.....	19	20.0%	8	32.0%	42	22.5%	9	13.0%	9	18.0%	1	6.0%	16.0%	
Unimproved.....	6	6.0%	5	20.0%	11	5.0%	16	23.0%	3	6.0%	3	17.5%	21.5%	
Died.....	26	27.5%	9	36.0%	66	35.5%	35	50.0%	26	52.0%	12	70.5%	50.0%	
	94		25		187		70		50		17			

TABLE XI

	LIGHT				MODERATE				SEVERE				ALL	
	Treated	No compression			Treated	No compression			Treated	No compression	No compression		No compression	
Improved etc.....	62	66.5%	11	44.0%	110	58.5%	19	27.0%	21	42.0%	2	12.0%	28.5%	
Unimproved.....	32	33.5%	14	56.0%	77	41.5%	51	73.0%	29	58.0%	15	88.0%	71.5%	

TABLE XII

	Treated				No compression			
	Unilateral	Bilateral			Unilateral	Bilateral		
Cured.....	8	5.0%	10	6.0%	0	0.0%	0	0.0%
Arrested.....	25	15.0%	12	7.5%	2	4.0%	1	1.5%
Apparent arrest.....	20	12.0%	14	8.5%	1	2.0%	0	0.0%
Quiescent.....	21	12.5%	13	8.0%	4	8.5%	6	9.5%
Improved.....	37	22.0%	33	20.0%	8	16.5%	10	15.5%
Unimproved.....	10	6.0%	10	5.0%	12	25.0%	12	19.0%
Died.....	47	27.5%	71	44.0%	21	44.0%	35	54.5%
	168		163		48		64	

Summarized on the basis of improvement or non-improvement:—

TABLE XIII

		<i>Treated Unilateral</i>	<i>Bilateral</i>		<i>Unilateral</i>	<i>No Compression Bilateral</i>
Improved, etc.....	111	66.5%	82 50.0%	15	31.0%	17 26.5%
Unimproved.....	57	33.5%	81 50.0%	33	69.0%	37 73.5%

TABLE XIV

	<i>National Sanitarium All Cases treated</i>	<i>Complete and par- tial satisfactory</i>	<i>Rivière's Summary</i>	
			<i>American</i>	<i>European</i>
Arrested.....	16.5%	20.5%	10.9%	16.1%
*Quiescent.....	21.0%	25.0%	10.8%	9.8%
Improved.....	21.0%	20.5%	29.2%	31.2%
Unimproved and died.....	41.5%	34.0%	49.1%	42.9%

*"Quiescent" here includes the cases classed "quiescent" and "apparently arrested," by the National Sanitarium Association.

Summarized on the basis of improvement or non-improvement:—

TABLE XV

	<i>National Sanitarium All cases treated</i>	<i>Complete and par- tial satisfactory</i>	<i>Rivière's Summary</i>	
			<i>American</i>	<i>European</i>
Improved, etc.....	58.5%	66.0%	50.9%	57.1%
Unimproved and died.....	41.5%	34.0%	49.1%	42.9%

provement in this type of controls; 58.5 per cent. improvement in cases of moderate severity as against 27.0 per cent. in this type of controls; 42 per cent. improvement in severe cases as against 12.0 per cent. in this type of controls.

Fluid accumulated in eighty-four or 28.8 per cent. of those receiving treatment. Purulent empyema developed in six cases or 1.5 per cent. of those treated. Spontaneous collapse following refills occurred in three cases or 0.75 per cent. of those treated. The 443 cases treated have received a total of 9,602 fills.

The average duration of treatment in this summary of cases has been two years.

Cured.....	3 years 10 months
Arrested.....	2 " 10 "
Apparently arrested.....	2 " 3 "
Quiescent.....	2 " 1 "
Improved.....	1 " 4 "
Unimproved.....	1 " 9 "
Died.....	1 " 1 "

Of the 443 cases attempted, 216 were unilateral and 227 were bilateral, respectively 49.0 per cent. and 51.0 per cent. See Tables XII and XIII.

This shows improvement in the unilateral cases of almost 35.0 per cent. more than in the same type of controls. The improvement in the bilateral cases exceeds that in the bilateral controls by 23.0 per cent and even exceeds the improvement in the unilateral controls by 19.0 per cent.

A comparison of our statistics with Clive Rivière's Summary of American and European results, more than confirms his statements of the value of artificial pneumothorax therapy in selected types of cases. See Tables XIV and XV.

What makes our results appear superior in these tables is probably the fact that our figures are for one institution where, to a large extent, we have been able to keep our patients under close observation and good régime for extended periods; Rivière's summary on the other hand, is the general average of many institutions, including several that, because of adverse economic influences and other reasons, are less fortunate in this respect.

Sympathectomy in Bronchial Asthma.—Cervical sympathetic ganglion resection was done by M. A. Ramirez and E. H. Pool, New York, in two cases of asthma. The patients had been under observation for a number of years. No improvement had resulted from the usual

methods of treatment. These cases show the apparent futility of unilateral cervical sympathectomy in bronchial asthma. Bilateral sympathectomy was not attempted.—*Jour. A. M. A.*, June 27, 1925.

STANDARDS IN CHEST RADIOGRAPHY*

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I THINK the title of this paper expresses very well what we have to say about chest radiography. It is not our intention to exploit individual opinions, but to outline those points that have been agreed upon as substantially correct, and which the practitioner can therefore accept as standards.

Radiography as applied to the chest is very much in its infancy both as to technique and interpretation. Great strides in technical procedure, such as practically to revolutionize the art, have been made in the last very few years, and equal progress will undoubtedly be made in the immediate future. The same is true of interpretation. Our lack of exact knowledge of the pathological processes represented by various radiographic shadows, is pathetic, and will remain so until many studies correlating tissue pathology with radiographic findings, have been made.

I think the key-notes of our talk on chest radiography should be great optimism for the future, and, without discounting its present value, outstanding conservatism in present day interpretation. I do not think we need hesitate in saying that well taken radiographs afford by far the most substantial and reliable physical sign available in the study of the thoracic contents, but we have far to go in learning to elicit and interpret that sign. As a physical sign, it invariably shows more extensive changes than do other physical procedures, and rarely misses anatomical changes, no matter how small or deeply placed. It is a fact that our leading radiologists often differ very greatly in their x-ray interpretations of a given case. Dr. Hickey of Ann Arbor, stresses that our radiograph is "A record of relative densities," and not a "picture" or "photograph." Dr. J. S. Pritchard of Battle Creek, very aptly describes roentgen examination of the thorax as "internal inspection." Hence our discussion of it as a

physical sign. Although radioscopy (fluoroscopy) holds a quite useful place, it is by no means commensurate in value with radiography (permanent records on films) especially as a diagnostic agent, and we shall therefore confine our comments to the latter.

Technique.—Although we do not purpose being technical, there are certain essential standards of technique which those of us who use this method in guiding the destinies of our patients have a right to, and should, demand. The more essential of these are speed and stereoscopy. By speed we mean that the exposures should be made in not more than one-tenth of a second and preferably much faster. To attain this, films rather than plates (the latter are now rarely seen) must be used, and double intensifying screens. These latter consist of chemically treated pieces of cardboard. They are placed one on each side of the x-ray film and act by reflecting the x-ray back and forth through the film materially lessening the time of exposure. Of equal importance is the use of modern cassettes for holding the films and screens, of such construction that the screens are pressed into perfect contact with the films. Otherwise marked loss of detail occurs as you see in the two films before you and might lead to faulty interpretation. The object of speed is to expose the pulmonary shadows in as nearly a stationary condition as possible. The beating of the heart keeps the pulmonary framework in constant vibration, especially at the base.

Regarding stereoscopy it is also an accepted standard that only stereoscopic pairs can be relied upon for chest interpretations. This procedure consists of making two films from slightly different angles so that when viewed in a proper viewing box, depth may also be seen. The need for stereoscopy is obvious in the demonstrated films, where a tuberculous opacity is seen in one film, but is covered by the rib in the other. This is a frequent occurrence. In fact from one-third to one-half of the pulmonary field is covered by the ribs in all films. Stereoscopy also

*Read before the Middlesex Medical Association at the Queen Alexandra Sanatorium, June 26, 1925. A series of representative films were shown.

allows us to localize shadows in the antero-posterior plane by giving a sense of depth. Although some radiologists claim that as much can be seen in the flat as in stereoscopic films, we hope that we have demonstrated that this is not so. I hope you will all take the opportunity after the meeting, of viewing and thus appreciating the value of stereoscopy.

A further technical point of importance is that of the density of films. We all have a tendency to over expose our films, whereas too great penetration may entirely obliterate delicate densities. The lighter the films the more extensive the shadows seen although the difficulty of interpretation is correspondingly increased. A happy medium of a nice grey, neither black nor very thin, is presumably the desirable average. Second quality technique undoubtedly is the most important cause of injudicious x-ray interpretations, with inexperience and unwarranted confidence a close second.

Rôle of Radiography in Chest Diagnosis.—If we grasp well the point that the shadows as seen by the radiographer represent anatomical structures and not function, we will have progressed far towards a rational conception of the place of radiography in diagnosis. Although we have of course learned that certain types of shadows are characteristic of, or commonly associated with, certain types of disease processes, we must not, however, let the radiographer diagnose for us. It makes no difference how extensive or apparently characteristic the shadows may be, they do not constitute proof of clinical disease, and conversely no matter how minimal or negative the x-ray shadows, they do not rule out disease and sickness. *Don't* let the radiographer diagnose. *You* must decide whether or not what the radiographer sees by internal inspection, is causative of, or associated with, the patient's sickness. In our institution thirty-two per cent of a group of fifty medical students, had radiographic shadows consistent with tuberculous disease, but only one had a clinical process. Individuals frequently present disabilities and radiographic shadows more or less characteristic of a tuberculous process, but complete investigation shows the sinuses or some other organ to be the seat of the illness. Without such complete study unwarranted conclusions will frequently be drawn in the presence of suggestive radiographic shadows. Apparently identical shadows are on occasion

seen in both the clinically tuberculous and the non-tuberculous. The x-ray cannot diagnose clinical disease for us.

Much to the fore in our present day x-ray interpretations is the custom of describing tuberculous shadows as active or non-active. Again this is a misconception of the function of the x-ray. Although it is true that certain types of shadow are often associated with progressive disease and other types with recessive disease, yet this is only a suggestion, and is frequently entirely wrong. The non-active appearing shadow may be accompanied by serious illness and the active appearing lesion occur in the clinically well. Again the most advanced and apparently characteristic tuberculous shadows will on occasion turn out to be something else, and the individual with a negative x-ray film will on occasion have a positive sputum.

Study of films.—In the study of chest films there are certain structures that we must view as a routine. In x-ray interpretations as in general medicine, it is true that we do not see anything we do not look for. Thus the spine, ribs, costal cartilages, width of intercostal spaces, and general shape and symmetry of the thoracic cage must be studied. The diaphragms, costo-phrenic sulci and mediastinum with special reference to the heart, aorta and trachea must each be considered. The most important changes to be seen in these structures are those of dislocation or distortion due to anatomical changes in the adjacent tissue. Less often we see actual disease of these structures such as dilatation of the heart or aorta.

Coming to the lung fields we see first the hilus shadows at the origin of the main stem bronchus. These are composed of the bronchi and blood vessels, lymphatic tissue, and binding connective tissue. Close standards of normal as to size and density cannot be given. They become more pronounced with age and probably any intrathoracic infection or growth can affect them. From the hilus radiate into the lung field in all directions, linear markings, most marked at the base, and in well taken films reaching nearly but not quite to the periphery including the apex. These linear markings are composed of the bronchi with their accompanying blood vessels, lymphatics, and connective tissue. The clear areas elsewhere represent the air cells and their walls, the latter being too delicate to throw

a shadow. These lung markings, like the hilus shadows, are almost impossible of definition in terms of normal. They also become more marked with age and can be affected by a variety of processes.

With these essential landmarks in view, it is apparent that intrathoracic processes may occur in one or more of the five main areas, namely, in the mediastinum, hila, bronchial tree framework, lung parenchyma, or pleuræ.

Regarding the mediastinum and hilus shadows, we will be brief. The mediastinum is one of the more obscure intrathoracic fields. The posterior mediastinal space may be viewed by obliquely exposed films. Suffice it to remember that tuberculosis as an essentially mediastinal or hilus disease, although it occurs, is unusual. The presence of opacities localized in these areas should excite thoughts of new growth rather than tubercle. Calcified or caseo-calcareous nodes in the hilus shadows are usually looked upon as evidence of previous tuberculous infection although other agents can probably also cause them. These are recognized by their great density and sharp outline. It must be remembered that we are speaking of adult chests and these comments do not in any sense of the term apply to children.

Coming to the bronchial tree, the most common change is a widespread more or less uniform thickening. Such a process if beyond the normal limits is often accompanied by a clinical so-called chronic bronchitis. Occasionally such a generalized bronchial tree thickening is accompanied by a positive sputum. Such shadows must, however, be regarded as non-tuberculous until proved otherwise.

Coming to the air cells or parenchyma of the lung we have the point of election for tubercle. The essential shadows of tuberculosis are localized areas as opposed to linear shadows. I sometimes define these to students as areas around which one could draw a pencil mark. Such localized areas may be minute and innumerable

as in miliary tuberculosis. Most often they are of larger size and composed of aggregations of tubercles, and may be solitary or multiple. The commonly described mottling represents such small areas. With more extensive involvement they become confluent and render solid whole lobes or lungs. Destructive processes may leave cavities which though quite characteristic of tubercle must not be accepted as diagnostic. As to location, localized opacities must occur in the upper half of the lung field to be considered as presumably tuberculous, and usually occur peripherally. Pneumonic processes, acute or chronic, are the chief opacities localized to the upper lobe that would be confused with tubercle. The one great fact, the recognition of which may make this paper worth while, is that we must have upper lobe localized opacities before we are justified in suggesting tuberculosis. Identification of opacities as localized or otherwise, is however, unfortunately not as easy as it sounds. The variety of pathological processes which accompany tubercle such as absorption, fibrosis, and pleural changes, often render an adequate decision most difficult. A broad experience is essential in the interpretation of all but typical films. Conversely, opacities in the lower half of the lung field are to be considered non-tuberculous until proved otherwise. Pure basal tuberculosis occurs but is rare.

Finally pleural changes and effusions occur as a result of various traumatic and infectious processes other than tubercle, and radiographically show no characteristic features if not associated with clinical or radiographic tuberculous lesions. Spontaneous pneumothorax should be considered tuberculous until otherwise proven.

In conclusion we would urge that practitioners and internists familiarize themselves sufficiently with stereoscopic chest films to enable them to view them intelligently from the standpoint of the presence or otherwise of localized opacities. To quote Gregory Cole, demand of your radiologist that he "show you a tubercle."

"WHETHER the piecing out of an old man's life were worth the pains I cannot tell; perhaps the play is not worth the candle."—Sir William Temple.

"WHEN all is done, human life is at the greatest and the best but like a froward child that must be played with and humoured a little, to keep it quiet, till it falls asleep, and then the care is over."—Sir William Temple.

Case Reports

THYMIC DEATH IN CHILD WITH GLANDULAR FAMILY HISTORY*

W. A. McINTOSH, M.D.

Simcoe, Ont.

Case History.—A boy, age four, when playing about the home had a sudden attack of what appeared to be a choking spell and died in less than ten minutes. *Post mortem* showed no foreign body in the trachea; the thymus was firm, well developed, over-large, each lobe measuring about two and a half inches in length and three-quarters of an inch in thickness; mesenteric lymph nodes were prominent; the lymph nodes of the neck were easily palpable; the spleen was enlarged.

Three years previously the boy had been circumcised; the anæsthetic was taken badly. His parents noticed that he was emotional, inclined to cry more than other children but voiced his cries feebly; after the operation this condition improved. He had had one slight convulsion before the operation but no recurrence. In spite of a ravenous appetite during the last six months he had become thinner. The mother blamed this on his over-activity at play. No urinalysis was made. He always objected to anything around his neck.

Family History.—Father, age thirty-four, had an operation for hernia six years ago. He also took the anæsthetic badly; since operation has had a pronounced tremor, coarser than the usual tremor of Graves' disease; general and variable. There is no exophthalmos, "Von Graefe's sign" or thyroid enlargement. Mother, age thirty-two had adolescent goitre subsiding at fifteen, which was treated with iodine; has had several miscarriages but there was no history of lues. A maternal grandmother has a large goitre; other maternal relatives have enlarged thyroids; an uncle of the mother has prominent eyes; one sister aged ten is overweight, a sister aged three is normal, a brother aged fifteen months resembles the boy that died, is thin and irritable but took ethyl chloride recently with no untoward effect. One sister died at eleven

months from some intestinal upset with convulsions.

A CASE OF SILICOSIS WITH AUTOPSY*

A. R. RIDDELL, B.A., M.B.

Toronto

The following is the report of the examination of a fifty-four year old quarry worker, made on July 8, 1924.

The examination was made at the request of Dr. J. E. Gimby, Sault Ste. Marie. Eight other workers from the same quarry were examined at that time. Two others in addition to the one whose report is given here were suffering from silicosis.

Family History.—This failed to reveal any evidence of tuberculosis.

Personal History.—When a young man he worked as a farmer for some years. For twenty years he worked more or less steadily in a saw mill, farming in the intervals. In 1917 he began work in a quarry near Sault Ste. Marie. He worked there the entire seasons of 1917, 1918, 1921, and 1923. His work was in the crushing room where a great deal of dust is produced. During the fall of 1921 (his third season) he noticed that he was short of breath and on two occasions he coughed up small amounts of blood. Since 1921 the shortness of breath has gradually increased. He had lost twenty pounds in weight. He had been unable to work for one year.

Present History.—He was very short of breath and while waiting for examination had a spasm of coughing. Very little sputum was raised and it was of mucoid character.

Examination.—He was a man five feet, five inches in height; moderately well developed and nourished. He looked ill. Breathing was laboured. He was short of breath even at rest; on slight exertion this condition became extreme. His temperature was 97° at 11 a.m.; pulse 112; weight 140 pounds. There was slight clubbing of the fingers.

*Read before the Section of Medicine, Academy of Medicine, Toronto, March 26, 1925.

*From Bulletin of Harvey Club.

The thorax was moderately well developed. The upper anterior, especially on the right, was flat. The upper fourth of the sternum and areas just lateral to it were depressed. The scapulæ were prominent. The right trapezius muscle was tense. Expansion was very poor, less on the right side than on the left. It was freer at the bases where there was indrawing of the intercostal spaces. From above the clavicles to the third interspaces anteriorly on both sides percussion produced a peculiar hyper-resonance with impaired note. To the seventh dorsal spine posteriorly on both sides there was moderate dullness. The note over the right base was less resonant than that over the left. There was bronchial breathing and increased voice transmission at the right apex. There were harsh bronchial breath sounds below the second rib and fourth dorsal spine on both sides. Medium sized dry râles were heard above the clavicle on right side, to the third rib on left side, and behind to the seventh dorsal spine on both sides. A few similar râles were heard at the right base laterally and posteriorly. Several sputum examinations failed to reveal tubercle bacilli. X-ray films disclosed the following:—*X-ray interpretations.*—To the fourth rib on both sides there are heavy, dense shadows. These shadows have the appearance of cotton wool. On the right side in the second interspace are seen several denser areas much larger than a bean. On the left side, standing out among the shadows described above, the shadows of the paravertebral and first and second interspace bronchi can be seen and those of the second interspace bronchus are markedly intensified. The lower third of each lung appears to be emphysematous.

Diagnosis.—Third stage pneumoconiosis (silicosis) with a possible added tuberculous involvement. This worker died on October 6, 1924. An autopsy was performed the same day.

Pathological Report.—The autopsy report is as follows:—On opening the thorax the lungs bulged out slightly from the chest cavity. The surfaces of both lungs were covered with dense fibrous tissue. The interlobar fissures were obliterated by adhesions. There were adhesions between the visceral and parietal pleura, and also to the diaphragm on right. These adhesions were very strong on the right side where they were broken down with great difficulty. The weight of the lungs was, right, thirty-eight ounces; left,

thirty-four ounces. The lungs, heart and other organs were forwarded for examination and sectioning to the Ontario Department of Health.

Report on the specimens was as follows:—*Gross specimen. Lungs:*—The bronchi show congestion. The œsophagus is apparently normal. The surface of both lungs in covered by dense fibrous tissue varying in thickness for 1.00 mm. to 1.5 cm. Attached to the surface are numerous tags of fibrous adhesions. The glands in the hilus and along the bronchi vary size from that of a pea to that of a hazel nut. On section the upper part of the lungs and glands cut with resistance and cause grating of the knife. They are of a bluish-grey colour, and show a few areas of congested tissue. The upper part of the lung consists of solid non-air-holding tissue which sinks when placed in water. The lower part is air-holding and emphysematous and shows bluish-grey solid areas scattered irregularly throughout, together with solid reddish congested areas. The arteries show sclerosis and numerous thrombosed branches.

The heart muscle was hypertrophied.

The spleen showed several adhesions to the capsule. There were numerous fibrous areas scattered throughout its substance.

The liver showed central vein congestion and cut with resistance.

The kidney was apparently normal.

Microscopical Report.—Serial sections through the upper lobe of the lung show a large proportion of the lung tissue replaced by fibrous tissue in whorl formation, with some areas undergoing hyaline degeneration. Scattered throughout the fibrous nodules are fine particles of exogenous pigment. There is also an occasional blood vessel present in the fibrous tissue. The alveoli remaining in this portion of the lung show numerous endothelial cells, filled with pigment, and also plasma cells. The walls of the alveoli are thickened and fibrosed. The interstitial tissue between the alveoli contain many young blood vessels around which are foreign body giant cells and endothelial cells filled with pigment. The interstitial tissue is also infiltrated with lymphocytes and plasma cells. The lumen of the bronchi and bronchioles is filled with lymphocytes, polymorphs, and plasma cells. The blood vessels traversing the fibrosed area all show a moderate degree of sclerosis. Several are thrombosed. In some the thrombosis is

undergoing organization. The slides from the lower lobe show a similar condition except that the fibrosis is not nearly so marked. There is an advanced degree of emphysema with oedema and congestion of the alveoli. The pleura covering the lung is thickened. This thickening consists of fibrous tissue which is oedematous and infiltrated with fibroblasts, endothelial cells, lymphocytes and foreign body giant cells. The endothelial cells and foreign body giant cells contain pigment. The slides of the glands show marked fibrosis, this fibrosis almost obliterating the normal structure. In the fibrosed area are scattered particles of pigment. In some areas this pigment is gathered together into solid masses.

The liver shows central vein congestion with numerous miliary areas consisting of foreign body giant cells and fibrous tissue showing hyaline degeneration, in the centre of which pigment particles can be seen surrounded by endothelial cells, plasma cells and lymphocytes. These areas are fairly numerous, suggesting that one of the glands had softened or ulcerated into a vein wall discharging its pigment to the blood stream.

The spleen shows a slight increase of congestion with increase of fibrous tissue and a few fibrous nodules scattered throughout. These nodules contain some exogenous pigment.

The kidney showed some slight glomerular fibrosis.

The pathological diagnosis was:—Pneumonosis (silicosis); thrombosis of upper branches of pulmonary arteries; bronchiolitis; emphysema and congestion of lower part of lungs; secondary deposits — spleen, liver, kidney; Neither the gross specimen nor the serial sections showed any evidence of tuberculosis.

Slides of the specimen and of normal lung were submitted for petrographical determination at the Department of Mineralogy, University of Toronto. The report received stated that the silica content as shown by the crossed nicol prism was five or six times as high in the silicotic lung as in normal lung.

Chemical analysis.—The percentage by weight of silica, expressed as SiO_2 , of the ash of the dried silicotic lung, liver, spleen, kidney and of normal lung was determined. The following was found:—Normal lung, amount of silica (SiO_2 content), 1.28 per cent.—2.67 per cent; silicotic lung, upper part, 20.38 per cent—33.36

per cent; lower part, 13.58 per cent—13.75 per cent.; liver, 2.29 per cent.; spleen, 2.23 per cent.; kidney, 1.60 per cent.

The specimen was mounted and the slides prepared by Dr. G. W. Loughheed. The petrographical readings were made by Mr. Ellis Thomson, of the Department of Mineralogy. The silica determinations were made in the laboratory of the Ontario Department of Health.

TUBERCULOSIS OF INGUINAL GLANDS

F. H. PRATTON, M.D.

Alexandra Sanatorium, Byron, Ont.

A girl two years old was admitted to the preventorium of the Alexandra Sanatorium, complaining of painful lumps in the groin. A gland in the left inguinal region was enlarged to the size of a horse chestnut, greatly inflamed, fluctuating and apparently ready to burst; in the right inguinal region a gland was felt, the size of a hickory nut, less inflamed but with some deep-seated fluctuation. The axillary and cervical glands were palpable. Pediculi were present in the hair and on the body. The skin especially in the inguinal region, showed many scratch marks. Physical findings were negative except a Eustace Smith murmur over the manubrium sterni. Radiograms of the chest were negative. Pus aspirated from the glands in groin showed abundance of tubercle bacilli.

This case is of interest because there are reasonable grounds for assuming that the inguinal glands were infected through skin inoculation—a very rare occurrence. The mother, who is suffering from far advanced pulmonary tuberculosis has shown herself to be very careless about her sputum, and there was an intimate association between the two in the home previous to admission. There was no evidence of genito-urinary tuberculosis and the enlarged glands elsewhere might readily be due to the vermin present.

The glands were aspirated, using a long needle, going in through healthy tissue at some distance from the gland, thus preventing rupture of the gland with sinus formation. Ultra-violet ray treatment was given. The glands have receded, the skin has thickened and taken on a healthy character. There has been no recurrence of pus for some time.

Editorial

THE *Journal* is in receipt of a letter from Professor A. Bruce Macallum of London, Ontario, with reference to certain statements contained in a paper upon liver extracts by Dr. W. J. Macdonald

which was published in the July number. This communication was placed before the Editorial Board and it was decided to refer it to a Special Committee of the Canadian Medical Association.

ANNUAL MEETING AT REGINA

THE Annual Meeting at Regina is over; we can now look forward to Victoria next year. The conjoint meeting of the Canadian and Saskatchewan Medical Associations was undoubtedly of great service to medical men of the prairie provinces and of educational value to the people in general also. The registration reached 363, and the new memberships were twice as many as were ever secured before at an annual meeting. The sessions were held in the Normal School and as this is on the outskirts of the city, lunches were arranged for each day at the college gymnasium adjoining. There was every inducement, therefore, to regular attendance, though even those who judge a convention by its golf, were reported as satisfied.

Medical meetings vary in general characteristics according to the centres in which they are held. This was essentially a general practitioners' meeting. Among the boys of all ages who flock to the big tents, there is, it seems, a growing dissatisfaction with three-ring circuses, and a growing preference for one ring at a time. The boys who attend the big medical shows are coming to the same conclusions. When a convention is so divided that each specialist or sub-specialist communes only with kindred spirits, in his own highly technical slang, about his own narrow problems, in some separate hole or corner, the general practitioner belongs nowhere, but wanders, often vainly, from specialist to specialist. The best-planned general medical con-

vention is one planned first, last, and most of the time, for the general practitioner.

And that is the very best kind of a meeting for the narrow and benighted specialist also if he will but attend it. He gets a needed enlargement of view in presenting for general information and discussion, in the one ring of the main tent, his special phase of medicine. He overcomes to some extent the handicaps of specialism, and remains, or becomes, a physician. Hearing constantly of the phases of medicine we live and work in daily is about as broadening as the weekly tattle of the local paper. If there is an important pronouncement of medicine, it is the surgeons chiefly who ought to hear it, and if there is some big thing in surgery to speak of, physicians even more than surgeons, need to hear it. Men who specialize in medicine or surgery, or eye, ear, nose and throat, orthopedics, pathology, obstetrics or x-ray need to contribute to, to learn from, to join in a general medical parliament in which the general practitioner dominates.

The Canadian X-Ray Association did get off into a corner by itself occasionally but attended practically all the main sessions also, and contributed useful papers of general interest.

The horizon of this Annual Meeting was broadened by the presence and the counsels of representatives of sister societies, especially of Mr. H. W. Carson representing the British Medical Association. Dr. West of Chicago repre-

sented the American Medical Association, and there were representatives also of the medical missionaries of China and of the Medical Association of Newfoundland.

The Council had two clear days of conference before the regular sessions began, which gave time for deliberate discussion of many problems. Various questions relating to medical education bulked larger than any others in this discussion, and, as is usual with these topics, no definite conclusions were reached.

A medical convention gives a fine opportunity for the discussion before general audiences, of health problems, and of inter-relations between the profession

and the community. At Regina seven or eight such addresses were given to the Service Clubs, the Canadian Club, and a general meeting on such topics as "Medical Research and its Value," "The Ideals of the Medical Profession," "The Health Programme of Saskatchewan," "When to be examined and Why," and "Quacks Ancient and Modern." Only a few years ago, it would have been difficult to find enough medical men to discuss such topics readily and interestingly with the public. Now it is comparatively easy, and most of these addresses to the public were of a high order. Altogether the Regina meeting was one of wide usefulness.

D. A. STEWART

ANTI-TUBERCULOSIS WORK IN CANADA

FEW subjects in general medicine have occupied the attention of the profession to a greater extent during the past few decades than the subject of tuberculosis. Tuberculous patients the profession have always with them. New thoughts, therefore, upon its various problems cannot fail to have interest for all our readers. Last year we devoted one of our numbers to a presentation of the valuable papers read at the combined meeting of the Canadian Tuberculosis Association and the Section for Tuberculosis of the Soldiers' Civil Re-establishment.

No excuse, therefore, need be offered for again presenting to our readers a few of the more important papers read at the last annual meeting of the Canadian Tuberculosis Association in Montreal; a meeting which had an added interest in the fact that it was the silver jubilee of the Association and was characterised by several outstanding features.

The Canadian profession may well be proud of the position in which the activities of this Society have placed their country. Sanatoria for the treatment of the tuberculous have been established in every province, with the exception of Prince Edward Island. Upwards of \$12,000,000 has been spent in the con-

struction of these institutions, which now present facilities for the treatment of over 5,000 patients, being 635 beds per 1,000 of the deaths occurring annually from this white plague. All these institutions are under the supervision of the several provincial governments, and are financially assisted by them. As a result of this effective provision our national death rate from tuberculosis has fallen from 180 per 100,000 in 1901 to 84.7 in 1924. This is the lowest rate on this continent, and is lower than any in continental Europe.

In furthering these most successful efforts the Dominion government, the several provincial governments and many of the municipal governments have all taken part financially, and, so far as practicable, they have brought to bear legislative assistance. The Dominion department of health has also given much attention to the incidence of tuberculosis in cattle; especially to the presence of infection in stock imported or held for breeding purposes and for the supply of milk to the public. In accomplishing this over \$2,000,000 annually is spent in the inspection of herds and the removal of those animals seriously affected.

In this good work our Canadian Red Cross Society has also been active, and has stimulated anti-tuberculosis efforts,

not only by moral, but also by direct financial assistance, to a total of nearly \$90,000 during the past few years.

Canada has every reason to be proud of these activities and the excellent results effected by their means.

The recent Association meeting in Montreal was more than usually successful, and was more largely attended than any previous conference. Representatives of every province were present. The scientific papers read were of a high order; much interest was also taken in the details related by the social service workers of the diverse home conditions met with in the less settled regions of both east and west.

The leading feature on the third day of the meeting was the visit to Three Rivers to inspect the dispensary clinic and the results obtained from the tuberculosis survey which had been recently established in that city.

Before this centre was opened the survey showed that only seventy cases of tuberculosis were known to the physicians of that city. As the result of the year's work 195 cases of active disease have now been recognized; 398 cases are

under observation for adenopathy, and 686, who have been exposed to infection and showed doubtful signs, are now under special supervision. Over 3,000 individuals have been examined; of these, 583 were factory workers; among whom 231 were found to show some signs of disease requiring attention.

In addition to the above dispensary work, the heads of industry have been induced to cooperate in every possible way. Not only have all employees now to pass an examination before they are taken on the payroll, but arrangements have been made to have every one examined once a year. When any suspicious signs are found in an employee he is at once referred to the dispensary for treatment. Of 525 men examined in one establishment, twenty were sent to the dispensary.

The spirit of optimism and cooperation shown at this annual meeting by the delegates of all the active centres from coast to coast, speaks well for the present status of anti-tuberculosis work in Canada, and assures a continuation of economic and scientifically organized effort in the future.

SLEEP AND SLEEPLESSNESS

SLEEP and sleeplessness has often provided a theme for the poet and a subject of research for the physiologist. An interesting lecture upon this subject was delivered before the Oxford Medical Society by Dr. Symonds of Guy's Hospital. The controlling influence of sleep lies undoubtedly in the central nervous system. Sleep consists in a complete cessation of conscious activity, together with a greatly diminished capacity to react to environmental stimuli. With this are associated phenomena in the other bodily systems, and these because they are more available for study have chiefly engaged the physiologist's attention. The result has been a tendency to lose sight of the central fact.

A theory of sleep which has obtained some credence is based upon the obser-

vation that in the sleeping state there is a fall of blood pressure and a diminution of the pulse rate. The suggestion is that at the end of the day the vasoconstrictor centre becomes fatigued. The systemic arterioles dilate and blood pressure falls; with this the supply of arterial blood to the brain drops below the point necessary to maintain the activity of the cortical nerve cells, and sleep therefore supervenes. Against this theory stand observations which show that in man the nocturnal fall of blood pressure and pulse rate occur independently of the sleeping state.

In a person accustomed to nocturnal sleep the body temperature reaches its minimum about 3 a.m. and this nocturnal fall persists even if the subject of investigation is awake and active. The

habit of going to sleep at a particular period in the 24 hours, if persisted in long enough, initiates a corresponding periodicity and rhythm in certain bodily systems, and this rhythm once established tends to persist of its own account independently of the sleeping state.

A fundamental feature of true sleep is its restorative effect upon the higher mental faculties, an effect completely lacking in the clinical experience of the anæmias; as the cerebral cortex is the most highly specialized of all tissues, it would naturally appear to require during sleep a maximal rather than a minimal share of the nutritious and cleansing stream. While the condition of sleep may closely resemble certain pathological conditions known to us as stupor or coma, and due either to anemia resulting from compression of the brain cells, or to the action of various poisons or toxins upon the brain cells, certain features serve to distinguish natural sleep from pathological stupor. First, in contrast with the condition of pathological stupor from which a patient may emerge in a dazed condition, true natural sleep is restorative. Its onset is relatively rapid and the awakening is also a rapid process compared with the recovery from stupor. There also appears to exist in healthy persons a remarkable ability to select by experience certain stimuli for which the threshold is relatively lowered so that they rapidly induce a waking, whilst for other stimuli of equal or greater volume the threshold may be relatively raised so that they do not rouse the sleeper. The most striking example in my own experience was that of learning to sleep soundly in a shallow dug-out behind which an eighteen-pounder gun was firing at frequent but irregular intervals whilst on the other hand the shriek of an approaching shell brought me in an instant to the full possession of my faculties. A more homely example is the ability gradually acquired by the child to respond to the stimulus of a full bladder, or that of a mother waking instantly to her infant's cry.

From these observations we may draw some conclusions as to the nature of

sleep; the rapid onset and the rapid awakening suggest a reflex mechanism; a reflex centre implies an afferent and an efferent pathway with a receptor mechanism at the one end and an effector at the other. The effector mechanism in this case must be one of inhibition, and this inhibition must be an inhibition of the function of conscious mental activity and therefore of cortical activity. This is apparently achieved by a blocking of the pathways along which afferent impulses normally flow to the cortical cells. Such a conception of sleep as due to a cutting off of the cortical cells from stimuli is not only in accord with the rapidity of onset and awakening and the restorative effect of the sleeping state, but provides an explanation of the difference between sleep and stupor. In stupor this is due to a direct effect upon the cortical cells, producing not only loss of consciousness, but loss of potential consciousness. In sleep the cortical cells are only inactive because they are protected from stimulation. Consciousness is lost but potential consciousness is unimpaired.

As a provisional classification of the insomnias Symonds suggests the following: First, sleeplessness due to disease directly involving the sleep centre, such as is met with in some cases of encephalitis; second, insomnia due to over-excitability of the cortical nerve cells as the result of either anæmia or poisons; and third, sleeplessness resulting from the presence of unwonted stimuli which inhibit the sleep reflex. There appears to be a great variety of stimuli able to withstand the reflex inhibition upon which sleep depends, and their power of effecting this will depend either upon their intensity or upon the degree to which the sleep reflex has been rendered prepotent. The most familiar classes of this group are muscular posture and tension, pain including discomfort, and emotional excitement.

The essential feature of the sleeping state is inactivity of the cortical cells concerned with conscious activity. This is also the essential feature of toxic stupor. The distinction however be-

tween the two states is that in sleep the cortical cells are inactive because they are shut off from afferent stimuli; in stupor their activity is abolished by the direct action upon them of a toxin. This has an important relation to the use of narcotic drugs, whose action is directly upon the cortical cells and is therefore of a toxic character. It is thus possible to induce the semblance of sleep even against heavy odds in the shape of discomfort and anxiety, but this is not the real thing. The restorative effect is lacking and the patient does not wake properly refreshed. We cannot however deny that narcotics may be of great value in the treatment of insomnia and this for two reasons; Firstly, the toxic effect of insomnia upon the cortical nerve cells may be more severe than that produced by the drug; it is a well known fact that insomnia may lead to depression of the higher mental faculties and may eventually end disastrously. Secondly, small doses of narcotics often facilitate the onset of true sleep. Habit formation however is extremely important in facilitating sleep. Most of us have acquired a ritual of some kind which stands us in good stead when sleep is threatening. It includes the whole business of undressing and getting into bed. With some the habit of reading in bed is often part of it. For this reason it is desirable that an invalid, whenever practicable, should sit up in a chair just before bedtime and go through some habit formalities.

Furthermore, sleep is incompatible with any degree of muscular ten-

sion. Some individuals are kept awake largely by their inability to relax their muscles. For a sleepless person to toss and turn is as a rule fatal to sleep; the wisest plan is to lie perfectly still and allow our limbs to be absolutely passive. The sleeplessness due to disease of the nervous centre is in my experience most difficult of all to treat. It would almost appear as if in these cases reflex inhibition has been converted by the disease into reflex excitation, and that the cortical cells are being abnormally bombarded with afferent stimuli. In the third group in which sleep is prevented by such unwonted stimuli, pain and discomfort must be treated by local measures and if necessary with drugs. The emotions which have most power to disturb sleep are naturally those which are painful. Paramount are fear and anxiety. In some cases sleeplessness appears to be due to repressed anxiety and demands a frank discussion of the underlying causes inducing emotional conflict. In the treatment of these emotional insomnias bedtime ritual and muscular relaxation are both of value. The narcotic drugs, however, are very frequently essential at the outset in the majority of cases. In these cases drugs may be given regularly for a short time to ensure sleep, but after the patient has had a succession of four or five good nights the dose should be gradually reduced without the patient's knowledge. Often the presence of a drug by the bedside allays much anxiety, and the patient may be able to sleep soundly without taking it, under the assurance that if he does not sleep he could take it without hesitation.

HYPODERMIC VACCINATION

IN a recent number of the *Sanitary Bulletin* published by the Department of Health in Montreal, Dr. L. A. Chabot, one of the district health officers, presents a report regarding a so-called vaccination method by the injection of anti-variolic vaccine under the skin. This method was introduced in the Spring of

1915 by various American army surgeons who reported that they had vaccinated by this method about 6,000 soldiers with a successful result in ninety-two per cent. (*Amer. Jour. Med. Sciences*,) Nov. 19, 1919, p. 721.)

This method directs that the contents of half a capillary tube of glycer-

inated vaccine to which has been added 1 cc. of sterilized water, is to be injected into the subcutaneous cellular tissue of the arm. A local reaction usually takes place within two to four days. Only in a few cases was this reaction delayed until ten to fourteen days. The local inflammation and induration in the great majority of cases passed away on the tenth day, leaving an almost imperceptible nodule in the cellular tissue. This reaction was similar to that of an anti-typhoid inoculation. In a few cases only was it so severe as to give rise to œdema of the arm. Many advantages were claimed. Dr. Chabot writes that the use of vaccines should not be confused with that of serums. A vaccine is a biological preparation which gives rise to a process of active immunization, that is, a process creating immunizing products, while a serum only introduces immunizing bodies already elaborated and effects what is called a passive immunization. Passive immunization is immediate but ephemeral. Active immunization calls for a period of incubation and the development of products necessary to bring about a reaction, but it is durable because the tissues trained to producing immunizing substances preserve for a long period the faculty of doing so. Antivariolic vaccination calls for a vaccine not a serum, and demands that the vaccination should be followed by reaction and by the formation of antibodies to effect an efficient and durable immunization. Experience has confirmed the fact that all antivariolic vaccination in order to be efficient must continue over a period of about twenty-one days and that the vaccine pustule must pass the three stages of rash, suppuration and desiccation, in order to bring about an efficient immunization. Antivariolic vac-

cine is used as a serum. It is injected into the subcutaneous cellular tissue which is a medium of absorption. The reaction lasts but a few days, there is no pustule, and although it may effect a temporary immunization, facts justify us in entertaining doubts of its permanent efficiency. These artificial vaccines prepared for injection, which are aqueous or oily solutions of organisms killed by heat, cannot be compared with the Jennerian vaccine, of which the organism has never been discovered and which is obtained from the natural contents of the pustule of a young heifer affected with cowpox. Chabot states that in his work he has found children vaccinated by this subcutaneous method who were again vaccinated a year later by true vaccine with complete success, a result which could not have been obtained, if the children had been permanently immunized by the previous subcutaneous method. Dr. Chabot emphasizes the following quotation:—"The epithelial tissue is and remains the favourite soil for the activity of the vaccine virus." Dr. Chabot states that in the case of fourteen children for whom permission was obtained by the parents to have them re-vaccinated in the ordinary way, thirteen reacted most typically, presenting a severe local reaction with formation of a vesicle and followed by a characteristic pustule which ran the course of an ordinary first vaccination. There was only one failure, and this child had been previously vaccinated three times with fresh vaccine without success and seemed to enjoy a natural immunity. Dr. Chabot demands that this new method whereof proof of its preventive or immunizing efficacy against smallpox has never yet been clearly demonstrated should be forbidden by law.

THE USE OF PHYSOSTIGMIN IN ABDOMINAL DISTENSION

EVERYONE who practises abdominal surgery observes gastric and intestinal distension occasionally. This symptom is responsible for much of the

post-operative distress that frequently follows abdominal operations. While usually relieved by such ordinary procedures as enemas, gastric lavage, or co-

lonic irrigation, it not infrequently occurs that after a comparatively simple operation distension ensues and persists despite all ordinary treatment and some cases leads to a fatal termination. There are many references in the literature of the past to the use of physostigmin for the relief of the more severe cases of distension, but its employment of late years has been in great measure discontinued as many observers stated that the drug was uncertain in its therapeutic effects, and that it gave rise on some occasions to very undesirable side actions and especially to a depressing action upon the heart. There have been few reports of any careful clinical observation of the effect of physostigmin on this condition when given in full doses. The usual dose recommended is from 1-150—1-100 grain, and when these small doses were employed reports were very unsatisfactory. In a recent number of the *Journal of the American Medical Association*, 1925, May 9, page 1407, Drs. Hayes Martin and Soma Weiss of Cornell University report the result of a prolonged clinical study of its action with special reference to the dosage necessary in cases in which simple measures had proved ineffective. The observations were made during the past twelve months, but further clinical and pharmacological studies are still being made. The cases under observation were divided into two groups. The first group included non-toxic cases in which abdominal distension followed simple operation. In the second group those cases were included in which the condition was associated with peritonitis or a general toxæmia. In every case various simple measures were had recourse to at first, and physostigmin was not used unless those measures proved ineffective. Our purpose was to learn whether physostigmin was capable of relieving patients not relieved by the simpler measures. All the patients who received physostigmin were in a serious condition manifesting alarming symptoms.

The results of our observation indicate that different patients show considerable individual variation in their suscepti-

bility to the action of the drug. The smallest single therapeutic dose that afforded relief in any of our cases was 2mg, (1-30th grain). A few patients received single doses of 1-8th grain. The average single dose employed by us was 1-16th grain. One patient required a total of 13mg (1-5th grain) administered in three doses within a period of four hours. The condition of this patient was especially grave before the physostigmin was given. All patients were carefully observed. Records were kept of blood pressure, pulse rate and respiration, and in every case a rectal tube was inserted in order to facilitate the expulsion of the flatus. The drug was given as a rule by intramuscular injection, which is to be preferred to the subcutaneous method. As a rule, within from ten to forty minutes after the injection of an effective dose the patient belches or expels gas from the rectum. These effects gradually increase in frequency, and the volume of gas expelled becomes greater. Defaecation accompanied by moderate colic may occur. There may be slight nausea, and an increase in the rate and volume of respiration. Moderate perspiration occurred almost invariably. The pulse rate is increased ten to twenty beats a minute, and there is commonly a rise in blood pressure of from ten to twenty millimeters of mercury. All of the sixteen patients in the group of non-toxic cases were completely relieved of the distension. The fifteen patients in the toxic group were benefitted very little or not at all. The relief was permanent in most of the cases to the members of the first group; in a few there was a return of the distension in from three to six hours. In these the dose was repeated once, twice or three times at the interval of from three to six hours. The results of our experience indicate that the drug should be administered in doses to induce its characteristic therapeutic effect, or until the occurrence of some system symptom indicated that the limits of safe dosage had been reached. The writers in their summary state that they consider that the drug has fallen into disuse partly, because of its employment

in insufficient doses and partly, because of the failure to distinguish the type of case in which it is effective. An effective dose of the salicylate or benzoate to be used in cases which do not yield to simple measures is from 1-20th to 1-16th grain injected intramuscularly. Such a dose may be repeated in an hour if the first dose does not induce any systemic

effects, and it may be repeated at least three times at intervals of three or four hours if there are no symptoms indicating a systemic action. In carrying out this dosage the general condition of the patient must be observed carefully; the heart action, the respiration and the condition of the pupil must serve as a guide to the frequency of repetition of the drug.

NEPHROSIS

ONE of the most difficult problems of clinical medicine is to get a clear understanding of the different forms of nephritis and correlate the symptoms and signs observed during life with the pathological changes found after death. It is a most unsatisfactory state of affairs to have to confess that we cannot tell in every case of nephritis exactly what changes are going on in the kidneys. What, again, do we know of the aetiology of the disease? We know that an acute nephritis may arise in scarlet fever or diphtheria, but are the chronic forms due to a low grade infection acting over a long period of time or are they caused by a toxin (blessed word!) arising from disordered metabolism.

Within the last decade and a half our knowledge of the changes in the chemical constitution of the body fluids of a patient suffering from nephritis has happily been greatly increased. These chemical studies have aided us greatly in classifying the disease and in deciding on the prognosis. Of late a new term, nephrosis, has been used to describe a condition which has some features in common with nephritis, but yet cannot be called a true nephritis. The condition has been studied already by Volhardt, Epstein, Eppinger and others, and we now wish to draw attention to a paper on the subject by Drs. Joseph Kaufmann and Edward Mason, of Montreal, (*Archives of Internal Medicine*, 1925, vol. 35, p. 561). These authors report three fatal cases (deaths through infection) illustrative of three different types of nephrosis. In type I, which may be thought of as the

early stage of nephrosis, there is massive oedema and anasarca with low blood pressure. The urine, which is of a high specific gravity, contains a large quantity of albumin and many casts but no red blood cells. The kidney when examined shows evidence of a degenerative process at work in the epithelial cells. In addition, although the urine contains globulin, there are no changes in the fundus oculi of uncomplicated cases, and there is a moderate but progressive anaemia and an inability to excrete salt. The amount of chlorides in the blood depends upon whether the oedema is developing or disappearing. The excretion of nitrogen end-products is normal, the non-protein nitrogen in the blood is normal in amount, and the chloesterol of the blood is increased. The total amount of protein in the blood is decreased but the globulin is relatively increased. Most of the protein in the fluids responsible for the oedema is globulin. The basal metabolism is decreased (calculated not from the true but false weight of the patient).

In type II, the next stage of progress, the blood pressure rises moderately, changes appear in the fundi of the eyes and the ability to concentrate the urine becomes impaired. Nitrogen excretion is impaired and fat makes its appearance in the urine and ascitic fluid. The massive oedema, anasarca, poor chloride excretion, increased amount of cholesterol in the blood and plasma, and transudates of type I are still in evidence. The third case represents in the opinion of the authors the life history of nephro-

sis, in the early stage the typical textbook picture, but progressing later through the second stage into a case of secondary contracted kidney:

Kaufmann and Mason in commenting upon nephrosis ask the significant question: "Is nephrosis a renal disease entity, or is it a local manifestation of a general systemic disturbance?" They state that it would appear that the oedema has little relation to the kidneys but may be due to an increased permeability

of the capillaries the cause of which remains unknown. They also offer a suggestion to explain the lowering of the basal metabolic rate. Again, the authors point out that the evidence to hand indicates that the true nephrotic kidney, if the patient escapes a secondary infection, progresses into a secondary contracted organ as a result of an organizing process of the degenerated cells and not of cells primarily inflamed. A. M.

DANGERS FROM UNDUE EXPOSURE TO ULTRA-VIOLET RAYS

IN a recent number of the *British Medical Journal* Sir Lenthal Cheatele calls attention to the observation made by him on the skin of an individual bronzed by sunlight, in which under the microscope mitosis was seen in the epithelial cells situated above the basal layer. He also referred to the fact that Dr. G. M. Findlay at the Pathological Section of the Royal Society of Medicine had stated that artificial ultra-violet rays hasten the advent of carcinoma in the skin of a mouse previously painted with tar. Sir Lenthal Cheatele said that he had also recently seen a lesion which had been exposed to the ultra-violet rays become worse in a very notable manner.

In opposition to these statements by Sir Lenthal Cheatele, Dr. Leonard Hill, the eminent physiologist, quoted from a work by Mr. Bernhard of St. Moritz, in which the latter stated he had never seen a case of epithelioma of face, or hands in any of the guides, drivers, postilions or postmen who were constantly exposed in the Alpine passes to intense sun radiation. In Dr. Hill's opinion no real apprehension need be entertained as to the possibility of the late development

of carcinoma on account of any bronzing by the sun's rays.

What however is disquieting to the profession is the use to which ultra-violet light in being put by those who possess little knowledge of its qualities. In a letter published in the *British Medical Journal*, April 11th, page 717, it is stated that a firm of builders had proposed to fit up the bathrooms of some houses with ultra-violet lamps. In an editorial the *British Medical Journal* states that if it were the case that the ultra-violet light generated by artificial means was exactly similar to sunlight it is probable that no harm would result, but there would appear to be some difference and it is recognised that in certain circumstances undue exposure to the artificial violet rays may be followed by most undesirable results. Eyes have to be carefully protected, and persons of a blonde complexion may be seriously burned. Unfortunate consequences have been reported following prolonged exposure of patients taking light baths without medical advice. The profession should recognize that overdosage may occur and may be attended with unexpected and undesired consequences.

"THE two great blessings of life are health and good humour, and both contribute more to one another."—Sir William Temple.

"HOPE is the sovereign balsam of life, and

the best cordial in all distempers, both of body and mind."—Sir William Temple.

"GOOD intentions are at the least the seed of good actions."—Sir William Temple.

Editorial Comments

BLOOD VOLUME AND COMPOSITION IN ŒDEMA

An interesting paper upon the Volume and Composition of the Blood and the changes incident to Diuresis in cases of Œdema, by Brown and Rowntree of the Mayo Clinic, appeared recently. Up till very recently there appeared to be a wide-spread belief that œdema is in some way associated with hydræmia. This opinion appears to have been to some extent a repetition of Bright's view that owing to the great loss of albumin in the urine in renal disease the blood became so thinned and watery that it passed through the blood vessels whereas normal plasma was too viscid to do this. Experiment shows, however, the futility of this conclusion. It is easy to produce hydræmic plethora by infusing saline solutions in large volume into the circulation, but even when the elimination of water is prevented by ligation of the kidneys œdema rarely appears. It requires something more than mere dilution of the blood, or hydræmia, even in the absence of normal kidney function to produce an excessive accumulation of lymph in the cells, intercellular spaces, or serous cavities of the body. A further popular hypothesis appears in the somewhat vague conception of plethora as a pathogenic factor in œdema. The total volume of the blood may be increased or decreased without any alteration of its constituent formed elements, and dissolved components. The recent clinical studies of Brown and Rowntree emphasize anew that one should no longer regard the blood changes associated with œdema and diuresis as due merely to the addition or withdrawal of water or even to simple changes in blood volume. The processes encountered are complex and probably involve changes in water, solids, volume of blood, and plasma and cells in varying degrees in different forms of œdema.

Their studies of the composition of the blood revealed no relation between hydræmia and the volume state. Diuresis exercises no fixed influence on the volume and composition of the blood. Only minor changes characterize the disappear-

ance of œdema of renal origin, and in some instances appear related to compensatory efforts of the blood to establish normal plasma cell volume ratios.

It is interesting to note that emphasis is being placed on œdema as a protective phenomenon. Like other tissues and organs of the body the blood may be provided with a mechanism safeguarding against excessive fluid accumulation. Aldrich in a recent paper referred to the possibility that œdema may have a protective or a curative function, and by diluting the toxins present in the cells may prevent serious toxic injury. As Aldrich expresses it "Œdema may be regarded as a temporizing mechanism rendering harmful products less potent until their genesis is stopped."

"ITIS"

Attention has been called recently in several periodicals to the fact that the suffix "itis" is supposed to imply inflammation. Bretonneau, many years ago, called attention to the fact that "itis" did not really indicate inflammation but was merely a feminine adjective often used as a substantive, the word "nosos" (disease) being understood. Since Bretonneau's time other writers have pointed out the true meaning of the word. Thus the word arthritis should not signify inflammation of the joint, but disease affecting a joint. Similarly nephritis and pleuritis simply imply disease of the kidneys and disease of the chest wall. The story of these recurrent discussions on the meaning of this termination is a good example of wasted effort, for the whole question was settled as early as 1826 in an etymological dictionary published in Göttingen in that year. The *British Medical Journal* adds to these remarks "it is to be feared, however, that much as we may regret the inaccuracy of the present usage of the word based as it is upon ignorance, it is too late to correct it, and we must submit to seeing medical literature disfigured by such monstrosities as "diverticulitis" and "appendicitis."

Men and Books

OTHER THINGS—AND POMANDER
STICKS

The physician of every age has always, we suppose, had something about him which seemed to distinguish him from the laity. The primitive medicine man amongst savage tribes to-day wears some distinctive head-dress or costume. In ancient Babylonia and elsewhere in the East the physician belonged to the class of priests, in the Middle Ages he was still an ecclesiastic, and as seen in miniatures of illuminated manuscripts he was tonsured. Chaucer's "Doctour of Phisyk" was recognizable by his costume:

In sangwin and in pers he clad was al,
Lyned with taffata and with sendal.

In France in the time of Molière the doctor gravely rode a mule on his daily round, and wore a large wig and a majestic beard. It was considered a scandal when one Guénaut dared to pay his visits on horseback, and *Guénaut et son cheval* became a sort of proverb. No one then could be a physician if he did not wear a beard; and such an impression did this appendage make upon the laity that in one of Molière's plays, when Argant thought of becoming a physician, Toinette exclaims, *Tenez, monsieur, quand il n'y aurait que votre barbe, c'est déjà beaucoup, et la barbe fait plus de la moitié d'un médecin*. It is even reported that a thesis was written upon the question, *An medico barba?* so important was it felt to be. We are reminded, speaking of beards, that in magazine advertisements within the last few decades, the doctor is always represented as wearing a vandyke. In England previous to Charles II's reign, doctors visited their patients on horseback, sitting like women, sideways, on foot-cloths. After the Restoration, they drove in carriages, and during Queen Anne's reign a London physician who was at all pretentious had his chariot and four, or even six, horses. "Within the memory of those now living," as Macaulay used to say, it was deemed essential for the doctor to have his coachman and brougham. Further changes have come about and certain types of motors are considered as peculiarly adapted by appearance and convenience for the use of doctors.

In the seventeenth century the physician often

wore a scarlet silk coat and on entering a house was followed by a footman bearing his gloves. It is said that the last silk-coated physician was Henry Revell Reynolds, who attended George III. He always wore a well-powdered wig, silk coat, breeches, stockings, buckled shoes, gold-headed cane, and lace ruffles till the end of his professional days.

The silk hat (which, by the way, was a most convenient place to carry one's single stethoscope) and frock or morning coat were held, up to quite recently, to be the *sine qua non* of the physician. The writer has even seen an old physician making his rounds in the wards of a London hospital with his "topper" on.

The doctor's stick was for generations a sort of badge of office. Historically, "the Gold-Headed Cane" which now lies in the Royal College of Physicians of London as one of its most treasured possessions, is the most famous. Through the medium of the pen of William Macmichael (1784-1839) it has for all time told the story of its successive masters, Radcliffe, Mead, Askew, Pitcairn, and Baillie, all leaders of the profession. It bears a cross bar almost like a crook or crutch, and in this respect was unorthodox, so to speak; the cane or stick peculiar to physicians carried a hollow knob as its head. This knob was a sort of vinaigrette, pierced like a pepper castor, and contained aromatic substances sometimes in the form of a powder. One sees old prints of physicians holding the heads of their canes up to their noses, for these spicy compounds were considered sovereign against the plague or other fevers. Of course the doctor on entering the sick-room must not forget to first strike his cane upon the floor to shake out a little powder before applying its top to his nostrils. To be sure, this performance makes a most impressive entry. One of the choicest liquors used, if powders were disdained, was *vinaigre des quatre voleurs*, so called because it was said that four thieves were rendered immune to the disease by it when they robbed the bodies of victims of the plague in Marseilles in 1720-1721.

Such sticks or canes as these are called by the name pomander, and there lives and practises in Harrogate a scholarly physician who has made a collection of them—and they are no longer easy to come by. So keen an amateur is he that he

once expressed to the writer his extreme regret that he had not secured a pomander stick which had belonged to a medical member of the Gurney family. It came into the possession of the late Sir William Osler, who was mightily pleased when he got it. It now reposes in the College of Physicians of Philadelphia.

The distinguished physician of Harrogate is deeply versed in the lore and history* of these canes and has classified them into three orders according to the form of the head or scent-box.

Pomander is a combination of the Latin word for fruit and the word amber, and at one time was spelt pomamber. By "amber" is meant ambergris, the concretion of the sperm whale, which is still used in the composition of perfumes. The physicians of the seventeenth and eighteenth centuries, however, were only following a lead given by the court ladies of earlier times. It is recorded that in 1321 the wife of the Earl of Hereford and Essex possessed a *poume de aumbre* or scent-ball. Henry V had a musk-ball of gold, and in Elizabethan times men wore scent-balls suspended from a long slender chain about their necks, and women wore theirs from their girdles. They were made in the form of a hollow perforated sphere and were quartered like an orange with the quarters hinged at the base, so when a segment was loosened sweet and disinfectant odours were exhaled, and my lord and his lady could mingle uncontaminated in the crowd. Another variant was an orange stuffed with cloves and other spices, and in the portrait by Sir Anthony More, Sir Thomas Gresham, the founder of the Royal Exchange, carries in his left hand a pomander resembling an orange.

For years in the last century surgeons were never without their little black pepper-pots of iodoform—these are now in bad odour! What will it be next?

ARCHIBALD MALLOCH

*See *Proc. Third Internat. Congress Hist. Med. London, 1922, Antwerp, 1923, p. 76.*

THE LIFE OF SIR WILLIAM OSLER*

Canadians especially have eagerly awaited the advent of these volumes and we venture to say that now the biography is published they will have no disappointment but the greatest pleasure in following Osler's career step by step

**The Life of Sir William Osler.* By Harvey Cushing, Oxford at the Clarendon Press, 1925, 2 vols. 8° and Oxford University Press, Canadian Branch Toronto.

throughout his life of three score years and ten. The author, the Professor of Surgery at Harvard University, was well chosen. Someone in England once remarked that it was curious that a surgeon should be Osler's biographer, but if the surgeon is big enough, and liberal-minded enough, Medicine in its broadest aspect must come within his purview. Besides, Dr. Cushing was peculiarly fitted for the task; he knew his hero well during the Baltimore days both within the walls of the Johns Hopkins Hospital and as his next-door neighbour for several years in West Franklin Street; they had much in common in their love of rare old medical books and their authors; and even when the Atlantic lay between them there were visits from both sides and a constant stream of letters and post cards in both directions. Many of Sir William Osler's letters to his biographer are published in these volumes without the fact being made known that they were addressed to Dr. Cushing.

In a general way outlines of the chief events of Osler's life are known to most of us:—his birth at Bond Head, Ontario, in 1849, his school days at Weston, his student days at Toronto and Montreal, post-graduate studies in London and Europe, his appointment as Professor of the Institutes of Medicine at McGill University in 1875 and his work as pathologist and physician at the Montreal General Hospital, his appointment as Professor of Clinical Medicine in the University of Pennsylvania in 1884, as Professor of Medicine at Johns Hopkins University in 1889, the publication of his *magnum opus* (*The Principles and Practice of Medicine*) in 1892, and his call to Oxford in 1905 as Regius Professor of Medicine where he remained until the time of his death in 1919 after two years of the greatest sorrow caused by the loss of his only son in the war.

Dr. Cushing has performed a difficult task and he has done it well. He has had to write for readers of both hemispheres; for those in England he gives Osler's setting in the backwoods of Ontario at Bond Head where his father was a Church of England missionary, and pictures the conditions of life in general in Canada and the United States, not to speak of telling the state of medicine in these countries. And for Canadians and Americans he portrays Osler in the midst of the university life of Oxford and describes the medical activities of

London in which Osler took such a prominent part. No doubt these volumes, of which the second deals entirely with the Oxford period, are full, very full, of detail, but was it not Johnson who said that biography is "the art of writing trifles with dignity?" The author, however, has not only made the best possible use of Sir William Osler's letters but he has also quoted quite extensively from some of his most characteristic and best medical papers and occasional addresses which are now hidden from most of us in old volumes of medical periodicals.

It seems to us that Dr. Cushing has written a book not only for to-day; but a century hence it will stand both as the biography of a great man and also as one of the best chronicles of medical life, of the rapid advances made in the art and science of medicine, and of such matters as the anti-typhoid and anti-tuberculosis campaigns, during the latter half of the nineteenth and the beginning of the twentieth centuries. Almost month by month we can learn from these volumes what was going on in the medical world. There is much too about the evolution of medical education in the United States and of Osler's introduction there of the method of teaching at the bedside.

One of the turning points of Sir William Osler's life was his abandonment of the study of theology after a short time for the study of medicine. We can only imagine what a struggle this caused in his mind, for in later years it was one of those things he would not discuss. Dr. Cushing has done well to point out that this occurred when the world sided with, or against, the opinions of Darwin and Huxley. Whilst Osler left theology for medicine, his teacher, Dr. James Bovell, of Toronto, to whom he was devoted all his days, quitted the ranks of medicine and entered the church. We can scarcely compute the loss to medicine had Osler taken holy orders.

Dr. Palmer Howard who shares with Osler's two other teachers, "Father" Johnson and Dr. James Bovell, a place in the dedication of *The Principles and Practice of Medicine*, writes that even in the early Montreal days Osler acted as a "ferment" amongst them. In Montreal, in Philadelphia, in Baltimore, and finally in England he had the power of "starting things," of getting young men to take notes and to publish, of creating book and journal clubs, of helping medical libraries and encouraging medical

societies, of interesting men in points of their own local medical history, of making others subscribe (after he himself had given) towards the painting of a portrait of a doctor or librarian who was about to retire, of initiating great activities such as that of a special department in a hospital for the treatment and study of tuberculosis, and a host of other things too numerous to mention. Dr. Cushing writes:—"But it is not easy to keep on his track when, as was often the case, he played an influential and helpful rôle behind the scenes while others occupied the stage. His method of helping to get things done when he saw the need, was an admirable, indeed an enviable one. Few have the primary imagination, the knowledge of the right people whose interests at the outset should be enlisted, the ability to give the initial impulse, and the unselfishness to withdraw and let others take the credit of the *fait accompli*. This is of course the great secret of getting things done in the world as many know; but he practised it, as many do not."

No one, we think, did his duty towards his fellow man better than Osler, but he realized too that he had a duty towards himself. When quite young he saw that to educate himself, and to get time to do this, he would have to withdraw and seek a quiet spot for himself, and his book. He loved companions but no matter who his visitors were he would go off to bed comparatively early and read for half an hour or more—and it was not mere lolling in bed with a light novel but close attentive perusal of the works in prose and verse of the world's greatest writers. And scarcely ever did Osler read without jotting down notes in his commonplace-books.

It was the realization of this duty towards himself, which led him to leave Baltimore and go to Oxford. He felt that, at the pace at which he was compelled to live by the demands from every side for his medical skill and his help in many other sorts of ways, he could not last much longer. This move required courage. In fulfilling this duty towards himself and towards his family by going to the Old Country he found a little leisure to cultivate extensively his taste for medical history and for bibliography. Indirectly the medical world at large has benefited much from this for his lectures upon *The Evolution of Modern Medicine* and numerous historical essays were prepared in England. In

Oxford he also set about adding judiciously to his library so that when he died he left one of the choicest collections to be found anywhere of books illustrating the history of medicine and the ancillary sciences. He bequeathed this library to McGill University and it is still being catalogued according to his own and very original plan. One of the most valuable points in these volumes is the way in which Dr. Cushing has told, year by year, of the books Osler was reading and of their authors. Very often the titles are given in foot-notes and the young physician who wishes—and has perseverance enough—can give himself the same sort of pleasant companionship with the authors and education from their works as Sir William Osler did.

A charming feature of this biography is the inclusion of many of Osler's brief epistles to little children. He was the friend of old people—and he hated to hear the advance of their days alluded to—but he was the playful companion of those of tender years. Only one gifted with the greatest sympathy and imagination could get down on the floor and frolic with children even in his latest years and could write such amusing letters to them. Often he "made pretend" as when he assumed a mock serious tone and signed his note "John McAdoo, Chief of Police." Indeed these communications are only "trifles" but we beg to think they reveal much of this great man's character. Mention, too, must be made of the quotations from the letters written by Lady Osler which are indispensable in filling in the background. She was his companion all the way and towards the end of his life the road wound so much up-hill that he had still greater

need of her. Her way of taking hold of things and her deep interest in all his interests made it possible for him to give himself up to his many and varied activities.

The illustrations, most of them from photographs, are as well produced as we have ever seen them in a book and the printing and paper are such that even the Clarendon Press (of which Sir William Osler was a Delegate) should be proud. The index is full and of itself almost forms a dictionary of medical biography and medical history.

In reading these volumes, on almost every page of which appear the names of new people and new places, we see Osler as if in the flesh. We see him as a "propagandist of public health measures" and as such Dr. Cushing feels he performed his "greatest professional service"; we see him as a biologist and pathologist, as an almost unrivalled clinical observer and teacher, as an author of the most considerable text-book of medicine of modern times, and as an author of many essays which will not soon cease to inspire medical men with a love for their profession and its ideals; we see him as a bibliophile and sympathetic historian of medicine; and finally we see him as he moved in and out among his fellow men (always lending a helping hand) living his motto *Æquanimitas* in joyous times and sad. His life was so beautiful in all its aspects and in all its actions that when we are placed in difficult or trying circumstances we feel as if we should ask ourselves: "What would Osler have done in our place?" The reading of these volumes will give us the answer many and many a time.

ARCHIBALD MALLOCH

Reduction of Increased Intracranial Pressure.—Max M. Peet, Ann Arbor, Mich., says that the slow reduction of increased intracranial pressure in the absence of shock, hæmorrhage, vomiting or dehydration is satisfactorily accomplished by the oral or rectal administration of magnesium sulphate. The rapid reduction of intercranial tension, in acute intercranial traumas unassociated with shock, is best accomplished by the intravenous administration of hypertonic Ringer's solution. Glucose may be given later to maintain the lowered intracranial

pressure. Hypertonic glucose solution administered intravenously is indicated when acute intracranial pressure is associated with shock or hæmorrhage, and in the less acute cases when complicated by dehydration, nausea and vomiting. Glucose has the following advantages over any of the salt solutions: prolonged action, no terminal rise in pressure, nontoxicity, nondehydration, increased blood volume in shock, and the control of acidosis.—*Journal A. M. A.*, June 27, 1925.

Abstracts from Current Literature

MEDICINE

Hæmophilia: A Study of the Blood, The Clinical Course and the Heredity in Three Cases. Davidson, E. C., and McQuarie, I., *Bull. of the Johns Hopkins Hospital*, May, 1925.

After reviewing the history of the disease, including the various descriptions and explanations of its etiology, the authors of this article go on to state that the result of their own research is summed up in two conclusions. *First*: That the only abnormality of the blood that has been present in all cases is a deficiency of prothrombin, which is therefore the predominant factor in this condition. *Second*: that the law formulated by Nasse in 1820, that only males are affected and the heredity transmission is entirely through females, must be considered the only possible theory. An interesting point in technique is that the authors remove their blood for experiment with a syringe that has been sterilized and then rinsed in normal saline.

Three case reports are presented, a sporadic hæmophilic unexplained by family history, and two typical cases representing two generations of the same family, the entire tree of which is given for eight generations, and bears out Nasse's law in every particular.

One of the two hæmophilics gave a history of improvement at puberty. The other showed dramatic recovery from marked exsanguination with transfusion. In both the coagulation time and prothrombin time were markedly lengthened, no other abnormalities in the blood being made out.

P. M. MACDONNELL

Atypical Case of Splenomegaly. Treiger, I., *Archives of Internal Medicine*, May, 1925.

The author reports a case which shows a very atypical course of splenomegaly. The patient, a female, is now sixty years of age. At forty-one years a diagnosis of enlarged spleen was made. The essential points in the history were, an attack of typhoid at ten years, eclampsia and miscarriage in the seventh month at twenty-nine years. A second miscarriage at eight months the following year. During the next eleven years she had three living children. In her sixth pregnancy the enlarged spleen was first discovered.

During the past nineteen years she has been under close observation and the progress of the disease can be divided into three stages. (1) Splenic, which has been in existence at least twenty years; (2) hepatic for at least a few years; (3) myeloid which has been in evidence for nine months.

It is possible that the spleen became enlarged during typhoid fever and never returned to its normal size, rendering it more susceptible to injury during eclampsia. The blood Wassermann has been negative throughout.

Enlargement of the liver was absent nine years ago. It became definitely enlarged by December, 1923. The blood pictures in the splenic and hepatic stages, show only signs of anæmia and leukopenia. The myeloid stage made its appearance during October, 1923. It was characterized by definite changes in the bone marrow manifested by typical myeloid changes in the blood.

The author points out that it is well known that the spleen, liver and bone marrow are interrelated in their action. He considers it probable that the normal regulatory action of the spleen over the bone marrow was altered in such a manner as to cause an abnormal depression of the activity of the bone marrow without marked alteration of its character, as is evidenced in the chronic anæmia and leukopenia, and by enlargement of the spleen and liver. In the myelogenous stage there is hyperactivity of the bone marrow, giving rise to increased leucocyte count, and appearance of nucleated erythrocytes, myelocytes and blood platelets.

It would appear very improbable, from the clinical course and observations made, that a chronic splenomegaly of long duration could suddenly become changed into another new disease, splenomyelogenous leukemia.

Banti's splenomegaly was ruled out, as there were no tendencies to hæmorrhage from either the stomach or rectum. Also the blood picture in Banti's disease always shows a secondary anæmia and leukopenia. In the terminal stage there are symptoms simulating atrophic cirrhosis of the liver, including ascites.

The etiology of this type of splenomegaly reported, is still obscure, but infectious diseases

like typhoid fever, which affect the spleen, are supposed to be predisposing.

Treatment by Roentgen ray as well as symptomatic treatment have apparently had no effect on the course of the disease. L. C. MONTGOMERY

Goundou. Roy, J. A., *Arch. Intern. de Laryngol.*, etc., Oct., 1924.

Dr. Roy draws attention to our present knowledge regarding this peculiar tropical disease, which apparently occurs chiefly in Africa, especially on the Ivory and Gold Coasts. The term "goundou" is that which is employed in the literature, but there are other names for the disease in the various tribes, such, for example, as "anakhré," signifying "big nose"; "hen-puye," or "dog's nose," etc. As these names imply, the disease attacks the nasal region chiefly, taking the form of bony tumours, but the entire skeleton may also be affected. It occurs most frequently in children, affecting males much more often than females, and is also found among the apes.

The cause of the disease is unknown, and there are no very convincing theories on the point. It has been suggested that it is due to a central nervous system lesion, but nothing of this nature has yet been demonstrated in the disease. That it is a manifestation of syphilis is very unlikely in face of the fact that no anti-syphilitic remedy known to us has any effect on it. MacLeod suggested that it was due to larvæ deposited by insects in the nasal cavities, but as Dr. Roy points out, there is often no preceding nasal irritation, as might be expected if this were the cause, and, again, the theory would not hold in a case of generalized occurrence. Microscopical examination has given no satisfactory results, but certain hitherto undescribed minute bodies have been found in two cases, and are being further investigated.

From such pathological examinations as have been carried out in the disease, it is described as being a true chronic osteitis, of a spongy and relatively vascular nature. The bony elements constitute only a small part of the growth, being replaced by fibrous tissue.

The course of the disease is slow, and may be arrested at the time of puberty, or, on the other hand, may then undergo marked exacerbation. The tumours are tender, and may give rise to sharp pains. Dr. Roy gives details of a series

of thirty-four cases. In no case was there any history of trauma, of tuberculosis, leprosy, or, except in one case, of syphilis. In twenty-three cases the disease was confined solely to the paranasal region, in eight cases it was also generalized, in three it was generalized without involvement of the nose.

The prognosis when the infraorbital ridge is involved, is that the eye will be destroyed; otherwise the disease appears to give rise only to inconvenience. Medical treatment has been of no avail, and Professor Roy believes that where at all possible surgical removal of the tumour or tumours, is not only palliative, but also checks the growth. H. E. MACDERMOT

Carcinoma and Sarcoma of the Œsophagus: A plea for early diagnosis. Jackson, Chevalier, *Amer. Jour. Med. Sc.*, May, 1925.

The author in this article insists that carcinoma and sarcoma of the œsophagus, with a mortality rate of 100 per cent. must be recognized earlier if any surgical technique is to be developed which shall deal with them with any measure of success. He urges with great emphasis the application of such diagnostic measures as the x-ray and œsophagoscopy, in all cases with suspicious symptoms. In the past, the diagnosis has depended in the majority of cases upon the terminal signs of emaciation, hæmorrhage, pain and cachexia, aided perhaps by the passage of a bougie, which may or may not indicate stenosis. But as Chevalier Jackson is at great pains to point out, this is a poor and oftentimes a fallacious test, and indeed, it is not without dire consequences in some cases, as perforation even of normal œsophageal wall has been seen in a case referred to the bronchoscopic clinic. Further, repeated instances have proved that the location of the growth as shown by bougie, has been incorrect; and again, certain sloughing growths may present no stenosis to the passage of the bougie.

The points of narrowing in the cervical portion, at the crossing of the left bronchus, and at the hiatal level, have been found in the bronchoscopic clinic to be the sites of election, as has been observed by others. Jackson's statistics show a preponderance of cancers at the lower third, which is the region most subject to irritation by food. As pointing to the influence of irritation, he cites the high proportion of

cancers occurring among women of the working classes in Scotland, thought to be due to the drinking of excessively hot tea; and a preponderance of cancer in the upper third in China, chiefly amongst men, is said to be due to the eating of excessively hot rice.

As for the age incidence, 75 per cent occurred between forty and sixty years, and the sixth decade showed the largest number. The youngest patient with cancer of the œsophagus was nineteen years.

Under symptomatology, the author calls attention to the importance of certain early symptoms, which are generally vaguely expressed, but cannot be disregarded. These might be generalized as a vague uneasiness in the act of swallowing, which may be but transitory, a feeling of cramp or nervousness in the throat, or of a lump rising in the throat, though never amounting at this stage to dysphagia. "Globus hystericus," even when occurring in hysteria, is not imaginary, but is due to a contraction of certain cervical and pharyngeal muscles, and a similar reflex contraction may be induced in cases of foreign body, and of organic disease of the œsophagus such as malignancy. Cough is sometimes an early symptom.

Late symptoms should not be waited for before endeavouring to make a diagnosis and in this stage palliative measures are all that can be adopted. "Dysphagia, odyphagia, pain, weight loss, hæmatemesis, emaciation and cachexia are all hopelessly late, so far as any attempt at cure of malignancy is concerned." Dysphagia, if marked, means obstruction, and indicates an advanced lesion. Although always a late symptom, it is noticed rather early in cancer at the cricopharyngeal and hiatal levels. Dysphagia is more often intermittent than progressive. Furthermore, this symptom may be entirely absent, as was noted in twenty-two cases. In sixteen of these, referred to as the cause of cervical adenopathy, the lesion was discovered in the cervical œsophagus. In six cases the absence of dysphagia was evidently due to the sloughing character of the growth, these having been referred in an attempt to explain an otherwise unexplainable melæna.

Hoarseness is nearly always present late in the course of the disease. It is sometimes due to recurrent laryngeal paralysis, but more commonly to an overflow into the larynx of secre-

tions or of food, owing to the subjacent obstruction. Occasionally it is due to arytenoid fixation.

Cough may be a late symptom from:—(a) Overflow of secretions into the larynx; (b) As a reflex from the area of the growth; (c) From erosion of the trachea or bronchus, chiefly the left, or into the parenchyma of the lung, especially the right.

The author then deals in an authoritative manner with the question of diagnosis, first by the x-ray, and then by œsophagoscopy. The fluoroscopic examination will not only often reveal evidence of malignancy, but will exclude aneurysm. "œsophagoscopy is the final arbiter which gives all the certainty of direct examination with the eye." By this is meant that the diagnosis can be made before the stenotic stage. The examination is made without anaesthesia, general or local, and frequently without hospitalization.

In one hundred and ten cases of malignant disease, proven by œsophagoscopy, no less than eighty-seven had been previously diagnosed (without these methods) as neurotic conditions. Jackson urges that every patient, regardless of the chief complaint, should be asked:—(1) Have you ever noticed any trouble in swallowing food or liquids? (2) Do you remember ever having had food lodge for a time before going down?

As to the prognosis, the mortality rate still stands at 100 per cent., but squamous-celled carcinoma of the œsophagus is a mild, slow, and for a long time, purely local process, and the hope is expressed that certain diagnosis may lead to the development of a surgical technique which may be able to cope with these tumours.

In Jackson's experience, in inoperable cases, patients live longest under a combination of early gastrostomy, a varied well balanced diet by tube, plenty of water by mouth and deep x-ray therapy.

A. T. HENDERSON

SURGERY

Gastric Tetany. De Bayle, Henri, *Annals of Surgery*, Vol. lxxxi, March, 1925.

Tetany is the name given to a syndrome which varies in its manifestations according to its origin, that is, gastric, intestinal, parathyroid, or pregnancy. The differences between gastric and parathyroid tetany have been demonstrated by McCallum and his co-workers. They are as follows:

1.—In parathyroid tetany there is a blood calcium deficiency, and its administration controls the spasms, while in gastric tetany the blood calcium is normal and little if any benefit comes from its use.

2.—Blood chlorides are diminished and their administration is of marked benefit in gastric tetany, while in parathyroid there is no alteration.

3.—A condition resembling gastric tetany can be produced by ingesting large amounts of sodium bicarbonate.

To sum up: In gastric tetany we have chloride deficiency with alkalosis; in parathyroid tetany a calcium deficiency. Gastric tetany occurs very rarely without obstruction of the pylorus, which prevents the discharge of acids from the stomach into the intestine for absorption. The obstruction is usually of a benign nature and not carcinomatous, the theory being that in the latter the HCl is not excreted into the stomach and consequently there is not an HCl deficiency in the blood, and alkylolysis is prevented.

Several theories are given as to the cause of gastric tetany, but the one most favoured is that hydrochloric acid fails to reach the intestine for absorption and alkalosis supervenes, with chloride diminution. Aside from pyloric obstruction and feeding of alkalis, tetany can be produced by over-breathing. The blood chemistry of gastric tetany is as follows: high CO_2 combining power, alkalosis, low chlorides, high urea concentration, increased sulphur and phosphorus, a rise in calcium, and a fall in sodium.

The prognosis of gastric tetany is poor, only two out of ten cases surviving. The symptoms are those of tetany with constant vomiting, leucocytosis, and albuminuria. The treatment is relief of the obstruction by pyloroplasty or gastro-enterostomy, administration of water, 5 per cent. glucose and normal saline by hypodermoclysis, intravenously, or enteroclysis.

R. V. B. SHIER

Gall-Stones and Diseases of the Gall-Bladder.

Mayo, Chas. H., *Annals of Surgery*, May, 1925, Vol. lxxxi.

The ætiological theories of gall-bladder disease during the past years have been three in number. At first gall-stones were considered of diathetic origin, the so-called humoral theory.

This was replaced by the infectious or bacterial, but now we believe that blood-chemistry changes antedate the bacterial invasion, and prepare the way for them (the bacteria) by disturbing liver function. The need at the present time is more knowledge of the relation of deranged hepatic function to biliary tract disease, and the assembling of diagnostic methods, medical and surgical treatment, and necropsy findings into one picture.

The gall-bladder concentrates bile tenfold, and in addition adds mucus. Only a small quantity of the total bile excreted reaches the gall-bladder. This fact is further demonstrated by the closure of a cholecyst-duodenostomy opening, if the natural route through the ampulla is even temporarily re-established.

Mann showed conclusively contractions of gall-bladder musculature occurring at the rate of from one to five per minute. It is probable that during these the fluid of the bile is filtered through the rich lymphatics surrounding the gall-bladder which extend into the liver.

The extent of pathological change in the wall of the gall-bladder is very visible. Stones are present in 70 per cent. of diseased gall-bladders and are secondary to infection.

The visible signs of gall-bladder pathology are obvious whitening and thickening of the gall-bladder wall. A deposition of fat beneath the serous coat is not normal. The liver is darker, rougher, and the acute angle of its edge is replaced by one less acute or obtuse. There is an adjacent liver cirrhosis. In cases of common duct obstruction existing over a long period, the back pressure on the liver cells causes a diminished output of bile. The gall-bladder filters out the bile fluid. At first thick, green, granular looking bile is present, but is finally replaced by white bile, which is colloidal mucus from the gall-bladder wall and which gradually distends the gall-bladder and common and hepatic ducts.

Cholesterol is present in many tissues and is classed as an alcohol, soluble in bile and in fat, but precipitated by water. Bile contains fat, cholesterol, bile salts and bilirubin, the latter a blood derivative, and calcium as bilirubinate and carbonate. Blood cholesterol is increased by excess of fat in food, and during pregnancy. Eighty per cent. of women who have gall-stones have borne children.

The gall-bladder should be removed to cure

the disease, unless the serious condition of the patient or acute pancreatitis contra-indicate.

R. V. B. SHIER

Cancer of Rectum and Recto-Sigmoid. Russell, James T., *Annals of Surgery*, May, 1925.

Carcinoma of the rectum comprises 80 per cent. of intestinal carcinoma, and according to vital statistics in the United States has increased 100 per cent. in the past fifteen years. The age occurrence is past middle life, but in the 100 cases forming the basis of this discussion, the youngest was twenty-two years and the oldest seventy. The disease occurs in children and is almost fulminating. In adults the disease is slowly progressive, invading peri-rectal tissues and glands later. Of 112 cases examined in Vienna at autopsy, fifty-five showed no peri-rectal invasion. If this be true one would expect that 50 per cent. of patients surviving this operation should be cured over five years or more. However, the ablest operators can show no such results. Mayo reports 28.3 per cent. living five or more years.

A study of the lymphatic drainage is essential in making a choice of operation. Miles' description is admirable. First, into the perineal body, ischio-rectal fat, and external sphincter; secondly, into the levators, the recto-rectal lymph nodes, the glands along the internal iliaes, the prostate, base of bladder, vaginal wall, and broad ligaments; and thirdly, upward to the peritoneal floor, the meso-colon and glands along the left common iliac.

The author favours the abdomino-perineal operation in either one or two stages. Of forty-five patients in whom radical operations were thus performed, seventeen lived over one year.

Pain, constipation and bleeding were the common symptoms, but diarrhoea which is really a frequent expulsion of bloody mucus was common. Other symptoms such as loss of weight, ribbon stools, sense of weight in the rectum, were present frequently. Eight of these cases had been operated on a few months previously for hæmorrhoids. This mistake was due to lack of examination. A sigmoidoscopic examination should not be omitted and a specimen should be removed for section. At the Roosevelt Hospital during the last few years two non-malignant rectums have been removed. The author closed by quoting Coffey, who states: "I shall not use

radium in carcinoma of the rectum again except for some extraordinary reason." R. V. B. SHIER

Acetylene, Ethylene, Propylene. Shipway, Francis E., *The Lancet*, May 30, 1925, p. 1126.

These three gases are inert, non-toxic, and are carried in simple solution in the blood. They are rapidly absorbed and rapidly eliminated. The form of anæsthesia produced is similar to that obtained with nitrous oxide.

In Germany acetylene is dried, carefully prepared and is put up in steel cylinders filled with porous material containing acetone in which acetylene dissolves easily. In order to remove the acetone, which gives acetylene an unpleasant smell and causes irritation to the mucous membranes, special washing arrangements have to be provided. The apparatus for this is fragile and not suitable for clinical use. Greater depth of anæsthesia can be obtained safely with acetylene than with nitrous oxide. Recovery is very rapid. Unfortunately the gas is very inflammable.

Being very inflammable ethylene is highly sensitive to changes of temperature. The cylinders must not be stored near any source of artificial heat nor left in the sun.

There is no danger of explosion if precautions are taken not to use a cautery, flame or a source of electrical discharge in the immediate neighbourhood of the patient. High blood pressure, arteriosclerosis, emphysema and myocarditis contraindicate the use of ethylene unless plenty of oxygen is given with it. The relaxation is superior to that obtained with nitrous oxide and oxygen, but much inferior to that with ether. There was severe vomiting in two out of the writer's sixty-eight cases.

Propylene is a gas with a smell somewhat resembling that of ethylene. Salivation may be profuse and is probably due to impurities. Recovery is quick, as after the use of ethylene. Anæsthesia may be induced in man in two minutes with a 50 per cent. concentration.

W. B. HOWELL

MISCELLANEOUS

Social Hygiene and Public Health. Frankel, L. K., Ph.D., *Jour. of Social Hygiene*, April, 1925.

Dr. Frankel remarks that we have no accurate knowledge to-day of the true incidence of

venereal disease, the statistics on the subject being in need of development. This is largely because the reporting of these diseases is not thoroughly carried out, although in nearly all states (in America) notification is required. The examination of men drafted during the war showed much infection amongst those coming from states whose health departments had reported only small numbers of cases. These draft figures are the best source of information on the prevalence of venereal disease.

Surveys of various large groups of the army show a greater prevalence of syphilis than the reports of routine clinical examinations indicate. Colonel Vedder estimated that about 20 per cent. of the young male population from which the army is recruited have syphilis, a higher figure than that indicated by investigations among groups in the civilian population. Dr. Frankel believes that an estimate of ten per cent. would cover the amount of infection in the United States: this is the figure given by the British Royal Commission on Venereal Diseases for the population of large cities.

Further information as to the incidence of venereal disease is gained from the mortality records, especially as regards syphilis. In 1922

there were 15,360 deaths registered, making a rate of 16.4 per 100,000 out of a population of 93,000,000. This group of diseases ranked twelfth among the leading causes of death. Six hundred and fifty deaths were assigned to gonorrhœa.

The statistics of a large insurance company are also quoted. These showed that the death rate from venereal disease increased regularly from 11.0 in 1911 to 16.5 in 1917, which was, however, partly due to more accurate reporting. In 1918 and 1919 there was a sharp reduction and the rate then remained stationary for three years, to rise again last year to 14.0, and in general it is concluded that the recent tendency is for the rate to rise. The United States Public Health Service in 1923 reported an increase of about one per cent. over 1922, with an increase in gonorrhœa of nearly ten times the increase in syphilis, but there was also a decrease in new or acute cases, and in the number of new patients admitted to the clinics.

There is need of greater co-operation between physicians and health departments, and Dr. Frankel feels that the social agencies may render great additional aid in the matter.

H. E. MACDERMOT

Ivy Poisoning.—The problem that has been studied by G. L. Krause and F. D. Weidman, Philadelphia, has been that of the preventive phase of ivy poisoning and not of the cure of the already established disease. Therapeutics was the second phase of their work. The work done by the authors confirms that: The discharge from the lesion does not disseminate the disease; the virus itself must come in contact with the part. Susceptible individuals may contract ivy poisoning at any time of the year, provided the juice of the plant comes in contact with the skin. As new findings they report that: Repeated attacks tend to shorten all the stages of subsequent attacks. Local immunity is not developed by repeated attacks of ivy poisoning. There is such a thing as absolute (and probably permanent) immunity against ivy poisoning. In their series, two-thirds of the men who believed themselves immune were not immune. In 45 per cent. of the susceptibles it

was necessary that some such defect in the epidermis, as scratches, should be present before a dermatitis would develop. It appears that all of the commoner laboratory animals are immune to this virus. Pruritus ani, transient, appeared in the majority of those receiving preventive treatment; in two subjects, hæmorrhoids were aggravated. The pain at the sites of intramuscular injections outweighs the danger of future attacks of ivy poisoning such as are only suppositious in the commoner walks of life. In their series of sufficiently controlled subjects, the preventive system of treatment of Strickler did not prevent; it is possible that the curative value of this system is likewise scant or nil, and that the beneficial results which have been reported are depended on and ascribable to the variable susceptibility of different individuals and the varying intensity of the irritant as applied at different times.—*Journal A. M. A.*, June 27, 1925.

Medical Societies

ONTARIO MEDICAL ASSOCIATION MEETING

The forty-fifth annual meeting of the Association was held in Toronto on May 5th to 8th under the auspices of the Academy of Medicine, in whose building the business sessions were largely conducted and from whose membership had been chosen the chairmen of the various sections and committees. The more purely scientific sessions were held in the King Edward Hotel. There was a striking and proper absence of those misplaced entertainments which so often in the past have interfered with the orderly conduct of affairs: the lesson drawn from previous meetings where whole sections have been deprived of an audience by some function staged in business hours has been learned. An unusually good programme had been arranged and the plan of conducting a meeting in open session without sectional programmes was tried out; this met with general approval. Of the papers, twenty-three were contributed from Toronto, twenty from Canada elsewhere than from Toronto, and four from the United States of America. The Association was privileged to be addressed by Dr. S. Basil Hall, president of the British Medical Association both in the sessions and at the round table. It is not the custom to comment upon individual contributions, but it can be said that the profession at large will wait expectantly for the further confirmation of the highly suggestive results reported by MacDonald, as having occurred in human patients afflicted with hypertension, after injection with liver extracts. The striking reactions in animals subjected to the same line of treatment by Western University experimenters was referred to in Dr. MacDonald's demonstration, and their work must be considered as also highly suggestive. Symposia occupied but little space in this year's meeting; the sessions were excellently attended and 730 members were registered as attending.

The round table dinner on May 5th brought out discussion on the question of ethics in connection with post-graduate lectures and newspaper contributions by the Association. The president's address: "The future of medical service," was delivered at the annual dinner on Wednesday. Class dinners were held on the

evening of the 9th. An unusually attractive lot of exhibits were in evidence, demonstrations of the otometer, of occupational therapy and of the "physician's selected library" may be specially remarked upon. The new Reception Hospital was open for inspection and visitors were addressed on Wednesday afternoon by Dr. Farrar, the physician in charge.

In the committee on general purposes, with an attendance of eighty-five, and Dr. Krupp in the chair, the report of the committee on necrology was received with members standing. It noted the deaths of Dr. W. H. B. Aikins, Toronto; Dr. J. J. Gee, Toronto; Dr. J. A. Greenlaw, Palmerston; Dr. J. W. Hart, Huntsville; Dr. W. Ray Hodge, Toronto; Dr. George W. Judson, Lyn; Dr. P. D. MacIntosh, Kitchener; Dr. W. H. Pepler, Toronto; Dr. J. A. Robertson, Stratford; Dr. Alexander Taylor, Goderich; Dr. D. Wallace, Ottawa; Dr. F. W. E. Wilson, Niagara Falls; Dr. G. F. Jones, Webbwood; Dr. D. M. Macklin, Stratford; Dr. S. J. Mellow, Port Perry.

Dr. T. C. Routley presented the report of the Board of Directors stressing particularly the holding of the National Conference in Ottawa, December, 1924, when problems of education, licensure and practice were debated. He noted that this conference had been suggested by the Ontario Medical Association; the work of the eighteen committees was reviewed. In the report of the counsellors of the ten districts it is evident that the value of the post-graduate courses is rated high; the visiting activities of the counsellors is apparent and the indications of organization are clear.

The report of the treasurer produced much favourable comment, and the excellent financial standing of the Association was considered a matter for sincerest congratulation.

In the report of the committee on credentials and ethics, attention was drawn to a letter sent to the Ontario Hospital Association concerning publication of hospital details apt to be embarrassing to the physicians of the staff. The greatest interest naturally centred upon the report of the committee on legislation and by-laws; as is known, the amendments to the Ontario Medical Act of 1925 are largely the suggestion of the premier of Ontario and of the Honourable W. F. Nickle. The old Ontario Medical Act of 1923 is

repealed, the definition of the practice of medicine is removed from the new Act of 1925, all drugless healers are placed in a class by themselves, and the use of the term doctor, physician or surgeon is forbidden to them, unless of course they are properly qualified practitioners according to the Ontario Medical Act. The vital part of the bill may be presented in full for the benefit of the *Canadian Medical Journal* readers.

Section 49 of the Ontario Medical Act is repealed and the following substituted therefor:

- 49.—(1) Any person not registered pursuant to this Act who takes or uses any name, title, addition or description implying or calculated to lead people to infer that he is registered under this Act, or that he is recognized by law as a physician, surgeon, accoucheur or a licentiate in medicine, surgery or midwifery, or who assumes, uses or employs the title "doctor," "surgeon" or "physician" or any affix or prefix indicative of such titles as an occupational designation relating to the treatment of human ailments, or advertises or holds himself out as such, shall incur a penalty of not less than \$25 nor more than \$100.
- (2) Subsection 1 shall not apply to any licentiate of dental surgery or any other person admitted to practise dentistry or dental surgery under the provisions of The Dentistry Act nor to any person registered as a pharmaceutical chemist under The Pharmacy Act

6.—The medical staff of the Board should be reorganized so as to promote: (a) Recognition of authority. (b) Cohesion and cooperation. (c) High standard of ethics. (d) Cordial and more intimate relation with the medical profession and medical institutions. (e) The attainment of more exact reports on the condition of the workers. (f) More personal knowledge of such, in association with the medical attendant, where circumstances and distance permit; and adequate arrangements to offset distance. (g) Efficiency, which, without proper organization, it is impossible to attain.

7.—The senior medical officer employed by the Board should be director of the medical services of the Board and should be responsible for the organization and administration of the medical services.

8.—He should have a sufficient number of medical and clerical assistants to adequately and efficiently carry on the work of this department, and members of his staff of medical officers should be largely relieved of clerical duties.

9.—His supervision of medical work for the Board should extend throughout the province, and in areas not easily accessible he should be represented by well selected medical referees, remunerated in accordance with the services performed.

10.—In cases of extraordinary difficulty or importance, in which the usual medical reports or specialists' reports are not conclusive it should be in order to assemble a medical board of three to conduct an examination and forward their opinion before final disposition of the case is arranged. Such a board should not be permanent but its members should be chosen in each case because of their particular qualifications and ability to advise conclusively in the case under consideration.

11.—The medical services of the Board should be brought to such a high standard of efficiency as to promote: (a) Adequate and well recognized scientific treatment for all workers coming under the provisions of the Act, so as to eliminate disability and hasten recovery and return to work, and in cases in which there is permanent disability, to minimize this to the greatest possible extent by suitable measures and appliances. (b) The attainment

of such records and reports as will supply, through the medium of public opinion, the basis for reliable assessment of disability, both as to duration and amount.

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the premier of the province of Ontario, and also to the attorney-general, and that it be intimated to them that if any changes in the Act or the constitution of the Board are contemplated, the Ontario Medical Association would appreciate the opportunity of appearing before the government, in a small representative deputation, to present this resolution in person, and to discuss the matter in greater detail.

Dr. Routley remarked that in Alberta there has been appointed a medical officer who shall act as additional referee.

The report of committees of public health and mental hygiene were received and adopted in the absence of their respective chairmen. At the next session the reports of the committee on Inter-relations was presented at length by Dr. H. W. Hill, chairman. This included the reports of the sub-committees on press publicity, on public education through local medical societies, and the hospitals, by Drs. Gordon Bates, J. P. Morton and C. H. Hair, their respective chairmen. This concluded the business programme of the Association.

New business transacted: The applications for affiliation of the Porcupine district and Dufferin county were received. The committee from the doctors of Thorold asking for redistribution was approved. Dr. Colbeck moved that the committee recommend that the Association pay the legitimate expenses of the counsellors in attending meetings of the board of directors; this was approved.

Dr. Henderson reported that he had received a letter from the pharmaceutical manufacturers asking that the Ontario Medical Association co-operate with them in the matter of obtaining an amendment to the narcotic drug Act, which requires a physician to furnish a signed and dated order when purchasing certain drugs classified as narcotics. It was moved by Dr. Henderson, seconded by Dr. Moore, that the Ontario Medical Association recommend to the Canadian Medical Association that they take such steps as they consider advisable in approaching the government of Canada to relieve the physician from some of the difficulties which arise out of the opium and narcotic drug act, 1923, such as the necessity of furnishing a signed order when purchasing such preparations as are sufficiently medicated to prevent their use for their narcotic content, decision in regard to the sufficiency of medication to lie with the Board of Health. Carried.

The Secretary presented the following resolution from the Hamilton Medical Society:

"The Hamilton Medical Society desires to go on record as being opposed to the placarding of the two diseases chickenpox and mumps, on account of the trivial symptoms manifested by both, and also on account of their negligible mortality."

It was decided to refer this matter to the committee on public health.

It was moved by Dr. Colbeck, seconded by Dr. Farley, that the committee on necrology co-operate with the President and Secretary of the Ontario Medical Association and the committee of the Academy of Medicine, Toronto, in taking up the question and deciding what steps are necessary to procure the desired information and put it on record.

Dr. Young moved an amendment, which was seconded by Dr. Grant, that a committee composed of Doctors Ferguson, Powell, Gwyn, Colbeck, Fotheringham and J. C. Connell, with power to add, be appointed to take up the question of procuring all available information with reference to the history of medicine in Ontario, and placing it on record. Carried.

The Ontario Medical Act, 1923, is repealed and notwithstanding anything in the Interpretation Act contained such repeal shall have effect as if the said Act had never been enacted and all acts and proceedings taken under and by virtue of the said Act are declared to be void and of no effect.

It is the general opinion that this is one of the best pieces of medical legislation which has ever been enacted. In contradistinction to the views on this bill may be noted the fact that the committee disapprove of the amended optometry Act which even allows the establishment of "faculties" of optometry if desired. The same committee reported on the relation of practitioners to the Ontario Temperance Act, and report that certain changes have been made; the cutting down of the number of prescriptions from fifty to thirty a month should be noted. Dr. G. W. Ross, in speaking, agreed to bring before the committee on general purposes a résumé of the legal aspect of the Ontario Temperance Act; this was presented in the afternoon session. Some detail of this must be put before the profession; it is to be realized now that the exceeding of thirty prescriptions a month is an offence against the statutes of the province of Ontario and punishable by fine, a "statutory offence"; previously, the issuing of over fifty prescriptions per month was simply the breaking of a regulation which brought the offenders into conflict with the license

commission board, and the discipline committee of the College of Physicians. The joint advisory committee was heartily thanked for their labours in connection with this above question of medical legislation.

The reports of the committee on education, of the joint advisory committee, of delegates to the Canadian Medical Association, of advisory committee to the board of license commissioners, of the editorial board, of the committee on hospitalization, were received and adopted.

The report of the committee on tariff was received and considered in two sections, the question of the propriety of a pre-operation diagnostic fee was actively discussed, the possibility of confusing such fee with fee splitting was debated. It was finally decided to give the diagnostic fee a place on the Ontario Medical Association tariff; contract practice was considered as differing essentially from lodge practice.

Dr. Farley in reporting on county health centres spoke of the needs in Hastings county and urged that the Ontario Medical Association request assistance from the department of health. It was suggested that relief might be obtained from the Red Cross. A communication was read from the Graduate Nurses Association of Ontario requesting the Ontario Medical Association to petition the government department of health to aid such rural communities as could not support a practitioner. Dr. Farley's report was received and adopted.

In presenting the reports on industrial medicine Dr. Henderson asked that the members report to the committee cases of industrial intoxication; the report was received and adopted.

The reports of the Workmen's Compensation Board were received and adopted. In this report the chairman Dr. Marlow states that it was thought opportune to make some representation to the provincial government, with the view of bringing about some changes whereby medical services performed for the board might be placed on a better basis and be accorded more fitting recognition; the committee, he further stated, had considered that two points should be stressed, first, that there should be at least one medical member on the Workmen's Compensation Board, second, that there should be a thorough reorganization of the medical services of the board. The complete draft of the resolution is as follows:

WHEREAS the purpose of the Workmen's Compensation Act is to alleviate the ills arising from injury or industrial disease by furnishing efficient medical aid to the workers and to compensate them during their period of

disability or to provide recompense in case of partial or complete permanent disability; and

WHEREAS the estimation of the amount and probable period of disability is founded upon medical opinion arrived at through professional study, observation and experience; and

WHEREAS the assessment of percentage disability of a protracted or permanent nature is obviously a matter in which experienced medical opinion must be taken into consideration; and

WHEREAS many inconsistencies in the awards by the Workmen's Compensation Board have come to the attention of the medical profession of Ontario and such have been the result of the failure of the Board to take medical opinion into account; and

WHEREAS though medical reports are available in each case for the guidance of the Board, under the present system of administration the interpretation of these reports is largely governed by legal or clerical opinion.

THEFORE BE IT RESOLVED THAT:—

1.—For the proper interpretation and administration of the Workmen's Compensation Act, selection for appointment to the Board should be founded upon previous employment, citizenship and general suitability.

2.—There should be at least one medical member of the Board.

3.—Such medical member should be carefully selected. His experience in medical and surgical practice should be such as to ensure his ability to correlate and interpret medical reports in such a manner that he may bring to the Board logical opinions arrived at as the result of professional experience, study and scientific knowledge, without which the Board will often fail to do justice to the workers on the one hand, and on the other may over-estimate disability or unduly prolong compensation.

4.—His professional standing and ethical integrity should be of such a high degree as to command the confidence and cooperation of the medical profession of Ontario.

5.—His administrative ability should be of a high character and he should have supervision over the organization of the medical services of the Board and should see that all medical matters are relegated to the medical staff.

The Secretary remarked that for some time he had thought the Ontario Medical Association could be doing some useful work in connection with the students in our medical schools. The American Medical Association has a system of following through the medical schools the course of every student from his first year on. He would like it to be considered, say until the semi-annual meeting, whether or not it would be available for the Ontario Medical Association to work out a

follow-up system along similar lines, at the same time, bringing the Ontario Medical Association before the students. Two purposes could be accomplished; interesting and useful information could be secured, and the interest of the students through their college years could be obtained. In this connection the following remarks made earlier in the day on the question of increasing the membership may be made.

Dr. Gwyn: The graduating classes of the three Universities should be met in their final year by the officers of the Ontario Medical Association, and, as each student graduates, he should have in his possession a circular from the Ontario Medical Association notifying him of its existence and its desire to have him affiliated with it when he goes out into the world. Dr. Bruce Hopkins suggested that every graduate from the three Ontario Medical Schools be automatically admitted as a member of the Ontario Medical Association for the first year after graduation.

Dr. Elliott reminded the committee that this action would not be constitutional; and recommended that the matter be sent forward to the committee on legislation and by-laws for their consideration.

It was decided that the directors be instructed to appoint a special committee for the purpose of inquiring into ways and means by which the membership could be increased; and that they report to the semi-annual business meeting of the Association; and further, that the matter of admitting into membership in the Ontario Medical Association all graduates, for the first year after graduation, be referred to the special committee mentioned above.

On motion, the meeting adjourned at 5.45 p.m. after it had been moved, seconded and agreed that this meeting approved of the work of the committee on general purposes as far as completed.

Extra-abdominal Conditions Simulating Acute Abdominal Diseases.—David Riesman, Philadelphia, discusses those extra-abdominal diseases which may simulate acute abdominal conditions, pneumonia, pleurisy, pericarditis, coronary thrombosis, rupture of a dissecting aneurysm of the aorta, true angina pectoris, tabes dorsalis, uremia, tonsillitis, lead poisoning, hysteria, diabetes, thyrotoxicosis, angiospasm of the ab-

dominal arteries, the so-called erythema group of diseases and herpes zoster, not only for the purpose of discussing the intra-abdominal causes of acute abdominal symptoms, but to point out those extra-abdominal conditions which, in their close mimicry of truly abdominal diseases, create diagnostic difficulties and lead to errors in judgment resulting in unwise and dangerous procedures.—*Journal A. M. A.*, June 27, 1925.

Miscellaneous

A NEW BLOOD TRANSFUSION APPARATUS

DANIEL McLELLAN, M.D., C.M., B.A.

Vancouver, B.C.

The following is a description with illustration of an apparatus for the direct transfusion of blood, with the introduction of citrate and saline solution into the blood stream as it passes through the apparatus. Also a few points on its use.

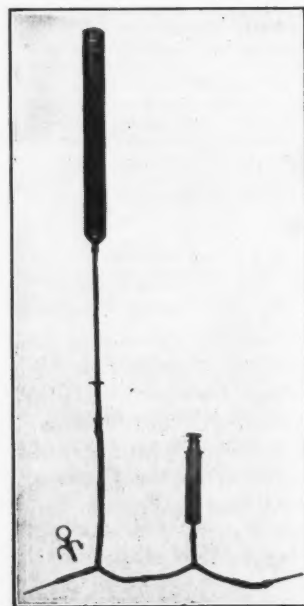
An all-glass 20 or 30 cc. syringe is attached by means of a suitable adaptor and rubber tubing to the stem of a Y-shaped glass tube. By means of rubber tubing the intake arm of the Y-tube is connected with the recipient needle. On each side of, and a short distance from the Y-tube is placed a cone-shaped glass valve, the one on the donor side with the apex pointing towards the donor, the one on the recipient side with the base facing the recipient. At a point midway between the donor needle, and the glass valve nearest the donor, a second Y-shaped glass tube is placed, to the stem of which a rubber tube twenty inches long is attached, the upper end connecting with a 300 cc. burette for citrate and saline solution. On this tube are placed a Murphy screw clamp by which the flow can be regulated down to a drop; and a cut-off clamp by which the flow can be completely cut off, as desired. The needles are of fifteen, fourteen or twelve gauge, and preferably gold. A small particle of erosion in a needle is a focus for clot. Gold does not rust. The needles are attached directly to the rubber tubing. Eliminate every joint possible.

Position of patients.—This is important. Tables should be placed in the form of an L or L reversed or a T, the recipient's table forming the foot of the L or the cross of the T. With the donor's arm slightly outward but in a general way parallel to his side and the recipient's arm stretched out at right angles to his own body, the two arms are in the correct position to insert the donor needle towards the finger tips and the recipient needle towards the heart.

A standard with a goose-neck attachment

capable of being easily raised or lowered stands in the angle formed by the two tables and is out of the way of the small dressing table. From this goose-neck hangs the burette.

The proportion of sodium citrate solution to normal saline is a matter which can be decided by the operator. By using a mixture of two (2) ounces of a 3 per cent. solution of sodium citrate with eighteen (18) ounces of normal saline solution and allowing sufficient of this mixture to come through in drops, it will be found that even less than one-third the amount of citrate is necessary than when given by the usual citrate method. In fact where smaller quantities of blood are being transfused, say six to ten ounces, as in children, once the first stroke of the syringe is made the citrate-saline solution may be cut off altogether.



Expelling air from the apparatus.—Clamp off the long tube. Fill the burette with warm citrate-saline solution. Screw down the Murphy clamp to allow a moderate flow. Immerse the needles in a bowl of citrate-saline solution. Release the cut off. A few strokes of the syringe will expel the air. The last bubble may be expelled by inverting the syringe. The automatic action of the valves may here be observed.

As the piston is drawn up the valve in the intake arm opens allowing fluid (blood) to be drawn up into the syringe, and as the piston is pushed down the valve closes, preventing the passage of fluid backwards through the needle. As the piston is pushed down the valve in the exit arm opens allowing the passage of fluid (blood) through the valve and into the vein of the recipient and as the piston is drawn up the valve closes preventing blood being drawn back from the recipient.

Regulating the flow of citrate-saline solution.—Place a suitable clamp (Day spring pinch cock) on the rubber tube between the (burette) Y-tube and the valve nearest to it. Screw down the Murphy clamp tight. Release the cut off clamp. Unscrew the Murphy clamp until the solution comes from the donor needle in drops about 100 to the minute. Close the cut off clamp until you are ready. Take off the pinch cock and place it on the tube between the (burette) Y-tube and the donor needle. The clamp could be placed here at first but in regulating the flow you would require to see that the syringe piston is not forced out by pressure of fluid, giving you a wrong conception of the rate of flow.

Inserting the needles.—Insert the recipient needle first. Immediately loosen the tourniquet and release the cut-off clamp on the burette tube. The liquid begins to flow through the apparatus into the recipient slowly but fast enough to keep the fluid in motion and gives no chance for the formation of clot. This bridges over that gap of direct transfusions, that space of time, sometimes short but unfortunately sometimes longer, between the insertion of the recipient and donor needles. See that the syringe piston is kept pressed home at this stage as it may be forced out by the solution. Insert the donor needle. Remove the pinch cock and proceed by steady easy strokes to pump the blood from the donor to the recipient. Count the strokes. By the simple

deduction of the quantity of citrate saline solution from the total, you will get the actual quantity of blood transfused.

A MEDICAL REPORT

We have received a copy of the thirteenth annual report of the medical department of the United Fruit Company. The work of this large department is manifold, and includes: Care of employees and their dependents, and of the inhabitants of communities close to the plantations in the tropics; care of passengers and crews on the company's steamships; physical examination of prospective salaried employees and of all the crews of the ships before they leave the home ports. Also, all matters concerning quarantine and immigration affecting the company's interests must be attended to; supervision in all matters pertaining to sanitation in the tropical division must be exercised; and, finally, the sanitary condition of the steamships must be maintained. There are ten divisions in the tropics, each with its own well-staffed hospital or hospitals.

The sections dealing with the "Organization and Comments on Vital Statistics" and "Comments on some of the Chief Tropical Diseases and their Treatment" are two of the most interesting in the report. We note what a menace malaria and pneumonia still are to the labourers. The section entitled: "Special Reports" contains amongst its articles one by J. Bequaert of Harvard University on an entomological trip to the Truxillo division, Honduras, to investigate the sand-fly problem, and another by Hideyo Noguchi of the Rockefeller Institute relating his observations during a brief visit to the Tela Hospital.

The most important event of the year chronicled in the report, *i.e.*, the International Conference on Health Problems in Tropical America, Kingston, Jamaica, July 21st to August 1st, 1924, is described. Many of the world's most distinguished authorities upon tropical diseases were present and read papers.

No state has yet ratified the agreement concluded by the first Opium Conference at Geneva. The British Government hopes to do so soon, but has first to consult certain protectorates. The convention concluded by the second Opium Conference remains open for signature till

September 30th, and cannot be ratified before then.—*B. M. J.*, May 23, 1925.

"SUCCESS will depend upon thought and care as much as skill."—Sir William Temple.

Obituaries

Dr. Bouchard, of Three Rivers, passed away at his home recently.

Dr. A. LaRoque, died recently at St. Rose. He had his office at 1830 St. Laurent Boulevard, Montreal.

Dr. Eugene Octave Bedard, a native of the Province of Quebec, died, aged seventy-one years, at his home in Pembroke.

Dr. George Wallace Brown died at Port Arthur, Ontario, on May 29th, 1925, at the age of fifty-nine, after a long and trying illness. He graduated from Trinity Medical College in 1895, and shortly afterwards started practice in Port Arthur. He was one of the founders of the Thunder Bay Medical Society, and by precept and example, he did much to induce a fraternal feeling among the members of the profession at the head of the lakes. Deservedly, he was greatly loved and esteemed by his patients. He was regimental surgeon of the 96th, (Lake Superior) Regiment, and a great deal of the medical work incidental to the preparation and return of overseas units fell on his shoulders. He carried this out faithfully and efficiently till he retired in 1920, with the rank of major.

Dr. David A. Hart, well known Jewish physician, philanthropist and veteran of the Fenian Raid, of 296 Sherbrooke Street West, Montreal, died at his home at the end of June. He was born at Three Rivers, and was the son of Capt. Alexander Thomas Hart. He graduated from Bishop's College in 1876, was married to Sarah Matilda David, daughter of Dr. A. H. David, dean of the Medical Faculty of Bishop's College. Dr. Hart was the first president of the Zionist Society in Montreal and he organized the dispensary of the Baron de Hirsch Institute. He also encouraged sports and was the donor of the Hart Cup to be presented to the most useful player of the National Hockey League. During the Fenian Raid Dr. Hart was a captain in the Prince of Wales Fusiliers and while he resided in the Eastern Townships he was a prominent Mason.

Dr. Laurie T. W. Penney, of New Germany, N.S. died at the Dawson Memorial Hospital, Bridgewater, on the nineteenth of June, at the age of forty-four

years. Dr. Penney graduated at McGill in 1907, and after a short period of practice in Nova Scotia, went abroad for post graduate study. He then started in Montreal, where he spent some years, but nearly ten years ago he was persuaded to return to Nova Scotia and take up practice at New Germany. There he quickly established himself in a large practice. His genial and sociable nature won for him many friends, while his professional qualifications commanded the respect of the community he served. As secretary of the Lunenburg-Queens Medical Society he was very energetic, and much of the success of that society was due to his efforts. For several successive years he was the medical health officer for the municipality of Lunenburg. His death followed a surgical operation from which he was apparently making a good recovery, until an acute nephritis developed and progressed very rapidly to a fatal ending.

Dr. Leverett George De Veber, Senator for Lethbridge, died on July 9th. By his death Alberta loses one of her best known public men. Following an illness of several months he died at his summer home at Aylmer, Que., where he had resided during the past two years, since leaving Alberta. He was born on February 15th, 1849, at St. John, N.B., and was the son of Richard Sandys and of Caroline De Veber. He was educated at Windsor, N.S. and later at the University of Pennsylvania, where he graduated in medicine in 1870.

Following his graduation he took post-graduate work in London, Eng. In the early eighties he joined the North-West Mounted Police as medical officer and for a number of years was stationed at Macleod, Alberta. After severing his connection with the Mounted Police he settled in Lethbridge, where he practised for many years with Dr. P. M. Campbell. In 1898 he was elected to the Legislature of the North West Territories, and again in 1902. When Alberta became a province in 1905 Dr. De Veber entered the first provincial cabinet as a minister without portfolio. He was the first member for Lethbridge in the new Legislature but only held his seat for a few months when he was called to the Senate.

In his youth he was well known not only as an oarsman, but also as a cricketer and was an all round athlete. In later years he was fond of hunting and fishing. His wife, who was Miss Rachel Frances Ryan, of Macleod, together with one son and a daughter, survive him.

G. E. LEARMONTH

Antagonistic Action of Posterior Pituitary Extract and Insulin.—From work performed on diabetic patients, Robert C. Moehlig and Harriet B. Ainslee, Detroit, believe that pituitary extract injections improve the muscular asthenia to a great extent. This is true despite the fact that the patients, for the purpose of the work, are not placed on a diet. Patients with hypopituitarism suffer from asthenia, and fatigue is easily induced. The opposite is true in cases of hyperpituitarism. Posterior pituitary extract injected into normal rabbits produces, as a rule, a slight rise in blood sugar. Posterior

pituitary extract, when injected simultaneously with insulin, prevents the fall produced by the latter. Posterior pituitary extract, injected during insulin hypoglycemic convulsions, produces a rapid rise in blood sugar, with subsequent recovery of the rabbits. The point of attack of the pituitary extract seems to be in the periphery; viz., the skeletal muscle metabolism.—*Jour. Am. Med. Ass.*, May 9, 1925.

"THE Divines seem to have the most honour, the lawyers the most money, and the physicians the most learning.—Sir William Temple.

Medical News from the British Empire

GREAT BRITAIN

A medico-legal case of grave import to the medical profession in Great Britain has just been concluded after litigation of nearly a year and a half. The case arose out of the detention as a lunatic of a Mr. W. S. Harnett, in 1917, at a home for the reception of lunatics, under the charge of Dr. Adam. Harnett was within a month's time allowed out on a twenty-eight days trial order, and during this time went to the offices of the Board of Control to ask to be placed in the care of the police rather than of his brother. He was received by Dr. Bond, a Commissioner in Lunacy, in whose presence he became excitable and steps were taken to have him sent back under Dr. Adam. Thereafter he was detained in various mental homes until he finally escaped in 1921, when prominent alienists whom he consulted certified him sane. He then brought an action against Dr. Bond and Dr. Adam, alleging conspiracy, assault, and false imprisonment, jointly and severally.

The case was tried before Mr. Justice Lush and a special jury, who found that Harnett was sane at the time of his being allowed out on the trial order; that Dr. Bond caused his detention until the attendants arrived to take him back to the mental home; that Dr. Bond did not honestly believe that the plaintiff was of unsound mind, or was unfit to be at large, but that he did believe that Harnett had escaped from his brother's charge, and that was why he sent him back; that Dr. Adam did honestly believe that the plaintiff was of unsound mind, but that he did not exercise reasonable care in taking him back. In the direction to the jury the judge said that they might take into consideration the whole period of Harnett's detention (1912 to 1921) if they thought it was the direct consequence of the acts of Drs. Bond and Adam in 1912.

The jury awarded £20,000 damages against Dr. Bond and Dr. Adam jointly, and £5,000 against Dr. Bond for the detention at the offices for which he was responsible. This judgment was reversed by the Court of Appeal, and later in the House of Lords this reversal was sustained.

Whilst the outcome of the case was still in the balance it was a matter of grave concern to the medical profession that it should be laid down by a judge, as it was by Mr. Justice Lush, that once a man was certified insane, each subsequent certification by a doctor should be only a mere formality, and not a new act intervening to break the chain of causation. In the Lord Chancellor's judgment, however, it was impossible to hold that Harnett's detention at the offices was the direct cause, not only of his "being retaken to the mental home, but also of his being confined in that and other mental homes.

There appears to be a slow but steady increase in the incidence of smallpox in Great Britain. According to the record in the Registrar-General's reports, the weekly numbers, which began in January with ninety-one, have gradually mounted to 176 in the seventeenth week and 162 in the eighteenth week. There has been, apparently, a relaxation of the regulations as to vaccination, the form of vaccination notice to parents being less stringent than heretofore. The fact that the type of the infection at present is mild, has brought forth many letters from opponents of vaccination contending that this is proof of there

being no need for the precaution. It is pointed out however, that Jenner showed that the mild form may occur in epidemic form as well as the virulent.

The Inter-State Post-graduate Assembly of America, met in London from June 2nd to 4th, under the leadership of Dr. Chas. H. Mayo, and was attended by 550 medical men from the United States and Canada. Dr. Mayo announced that 60 per cent. of these men were general practitioners, and the programme which was offered is evidence of the attempt to meet their needs. On the first morning, for example, four lectures were delivered, the first by Sir Humphry Rolleston on the etiology and treatment of gall-bladder disease. He spoke of the infective and metabolic or biochemical factors in the formation of gall stones, and said that both must be taken into account in prophylactic measures and treatment. He thought that hexamine was undoubtedly of value in these infections. As regards prophylactic measures, he would restrict foods rich in cholesterol. Frequent small meals would counteract stagnation of bile in the gall-bladder, and these should be supplemented by exercise. Attempts to dissolve gall stones could not be regarded as likely to succeed. That they were dissolved by olive oil *in vitro* was little evidence of the action which took place in the gall-bladder.

Sir Arbuthnot Lane spoke on "The first and last kink." He held that certain changes which came about in the body to establish mechanical relationships with its surroundings, were at first useful but later tended to shorten the life of the individual. In the gastro-intestinal tract, for instance, the first and last kinks were simply mechanical but later "resulted in contamination by septic organisms." He had been greatly impressed in his long experience, with the connection between cancer and gastro-intestinal stasis. He held that there was a mechanical and toxic factor in the causation of cancer, and he had so often observed cancer following on the mechanical and toxic results of intestinal stasis that he felt sure that the sequence was no accident. He had laid down principles of treatment in such conditions twenty-five years ago, and still held to them. Free use of paraffin was useful in lubricating the canal and softening the contents. Suitable diet, kaolin, and belladonna were useful adjuvants in controlling the spasm of the inflamed bowel. A simple operation in some cases was sufficient to free the anchored bowel and permit the free passage of its contents. He would draw attention to the importance of recognizing the causal relationship of all these troubles of the proximal bowel, and of the need of instructing the public in proper dieting and in the habit of evacuating the large bowel.

Sir Thomas Horder spoke on "New diseases for old." They had their natural history, like men and animals. Old diseases tended to disappear or lose their virulence, and were replaced by new ones. The Ministry of Health was largely responsible for the lessening of such diseases as diphtheria, typhoid fever, anthrax, hydrophobia, etc., and certain industrial diseases, such as lead poisoning were becoming comparatively rare, thanks to the working of the Factory Acts. The betterment of general living conditions was largely responsible for the relative infrequency of such diseases as tuberculosis and rickets. Acute articular gout seemed to be less than formerly, but it was

not clear whether this was because people drank less alcohol, or took different beverages from those favoured by their fathers. We had, however, to face a series of disease processes in which the conditions were less precise: there was, however, a large functional disturbance—neurasthenia in all its forms, arterial hypertension, with arterio-sclerosis, functional heart affections, with myocardial defects accompanying them or following them, hyperthyroidism and perhaps diabetes. There was a large increase in conditions due to *B. coli* or associated strains, and also of cases of bacterial endocarditis associated with strains of streptococci. There was good reason to regard these and many other types of sepsis as saprophytic infections resulting from lowered tissue resistance. Were we becoming the prey of our own saprophytes, and if so, why? Modern life had eliminated many causes of disease, but there had been an increase in the nervous and emotional strain of living. We knew too little of the effect of the nervous system on immunity or infection.

The concluding lecture was given by Dr. Arthur Hurst on the pathogenesis and treatment of Addison's

anæmia and subacute combined degeneration of the spinal cord. About 85 per cent. of these cases sooner or later had some nervous symptoms, which we now know to be due to degeneration of the spinal cord. He believed, that these two diseases were really due to the same cause, namely, an infection which began in the mouth. In both there was an absence of hydrochloric acid in the gastric juice, and this probably was a preceding condition. It was advisable to examine the blood and stomach contents in all cases in which this condition was suspected, and it was possible by early treatment to prevent the development of the anæmia and the nervous disease. He urged the employment of a combined treatment to combat in every possible way the intestinal infection which seemed to be the cause of these two conditions, at the same time overcoming the results of the infection by transfusion and by arsenic. He closed by referring to a case in his experience in which a man who had been cured of Addison's anæmia became on two occasions a very successful donor of blood to patients with a similar disease.

AUSTRALIA

Among the list of publications we have received lately dealing with public health, is *Health*, the Journal of the Commonwealth of Australia's Department of Health. This journal is a compact and well-written account of the various activities in the field of public health in Australia. It is highly indicative of conditions prevailing in that country, that the opening paper is devoted to the attitude of labour towards the industrial welfare movement, in which it is made clear that organized labour examines very closely all plans which profess to further the welfare of the workers. It is asked, for example, whether the industrial welfare movement will extend any further than social

activities and improvement of working conditions, so far, for instance, as to include workers' representatives on the board of management in various industries. Or, again, is it to create "a satisfied, sport-loving worker, or to create a healthy, vigorous, educated mind, ever striving for a higher ideal."

It is interesting to note that following on this paper there is an account of the welfare work being done in a large firm in Sydney, from which we learn that the workers are allowed to control practically all the activities of the scheme, an effort being made to avoid any feeling of patronage on the part of the company.

H. E. MACDERMOT

News Items

NOVA SCOTIA

Dr. C. F. Moriarty, a recent graduate of Dalhousie, has accepted an appointment with the International Health Board, and is at present stationed at Andalusia, Alabama. His marriage to Dr. Mabel Angela Magee, a graduate of Dalhousie in dentistry, has just been announced.

While at Halifax, en route to the meeting of the Medical Society of Nova Scotia at Bridgewater, Dr. Harris MacPhedran, of Toronto, addressed the Halifax Rotary Club. His subject, "Reminiscences of Salonica," was illustrated with lantern slides and the address was much enjoyed by the Rotarians.

As a result of the provincial elections held in June, four medical men will have seats in the next legislative assembly. These are Dr. W. N. Rehfuss, Bridgewater; Dr. J. A. MacDonald, St. Peters; Dr. B. A. LeBlanc, Arichat; Dr. J. L. MacIsaac, Antigonish. The *Journal* extends congratulations to all these gentlemen.

The annual meeting of the Association of Medical Health Officers of Nova Scotia was held at Bridge-

water on the 30th of June. In the absence of the President, the chair was occupied by Dr. E. D. MacLean, M. H. O. of Truro. Morning and afternoon sessions were devoted to the discussion of various problems which confront the medical health officer, particular attention being given to the possibilities of dealing more effectively with tuberculosis. The work of the several tuberculosis clinics which are conducted by the provincial department of health was highly recommended. It was noted that Nova Scotia enjoys a relative freedom from diphtheria, typhoid and the para-typhoids, in comparison with most other provinces of Canada. Whooping cough has been unusually prevalent of late, and during the past year accounted for more deaths than typhoid, measles, diphtheria and scarlet fever combined. The evening session, which was presided over by Mayor Brignell, was open to the public, and was under the patronage of the Bridgewater Women's Institute. A number of physicians who had arrived for the annual meeting of the Medical Society of Nova Scotia were in attendance. After several health films had been shown, addresses were given by Dr. R. E. Wodehouse, Secretary of the Canadian Tuberculosis Association, and Dr. L. A. Peque-

gnat, of the Canadian Social Hygiene Council. Officers elected for the ensuing year are Dr. E. D. MacLean, President; Dr. R. L. Blackadar, Port Maitland, and Dr. A. S. Kendall, Sydney, Vice-Presidents; Dr. A. C. Jost, Halifax, Secretary; Dr. M. T. Sutherland, Glace Bay, Dr. W. T. Purdy, Amherst, and Dr. R. H. Sutherland, Pictou, Councillors.

An attractively printed report of the work accomplished by the Massachusetts-Halifax Health Commission, during the five years of its activities which ended in September last, has recently been issued. The record is one of which the Commission may justly be proud. While the credit for the substantial reduction in the general death rate, the infant mortality rate and the tuberculosis death rate, which has been effected in Halifax since the Commission began work in October, 1919, must be divided in indeterminate proportions among several agencies, there can be no doubt that a large share rightly belongs to the Commission. The interest in the public health aroused by the Commission through the opening of health centres, the instructional work of doctors and nurses, and the dissemination of literature has doubtless proved advantageous to other agencies by enabling them to obtain support which has previously been denied them. While the vigour which characterized the organization of the scheme may have been a bit dramatic and even disturbing to the more conservative, and while the Commission has not wholly escaped from criticism, it appears to be the general opinion that a notable demonstration of the value of the newer methods has been made, and that it is most desirable that work similar to that initiated by the Commission should be continued on such a scale as may be found practicable. As the fund which was placed at the Commission's disposal is now approaching exhaustion, considerable curtailment of activities has been made recently, and it is believed that after a few months the work will be limited to that directed from the Dalhousie Public Health Clinic.

For the ten years before the Commission began work the general death rate of Halifax had averaged 20.2; the infant mortality rate, 187; the tuberculosis, (pulmonary) death rate, 179. For 1923-24 these rates were 11.7, 97.4 and 101 respectively. While errors in the estimate of population may make the accuracy of the general and the tuberculosis death rates somewhat doubtful, the infant mortality death rate is computed on a basis which permits a comparison which can scarcely be disputed. On this showing alone, the value of organized endeavour may be said to be established.

The Medical Society of Nova Scotia held its seventy-second annual convention at Bridgewater, on the first and second of July, under the presidency of Dr. W. N. Rehfuss. An excellent attendance, a good programme and unbounded hospitality combined to make the meeting most successful and enjoyable. The Canadian Medical Association was represented by Dr. Harris MacPhedran and Dr. H. B. VanWyck, of Toronto, who delivered the addresses in Medicine and Obstetrics respectively. Both of these gentlemen were warmly welcomed, and their addresses proved most

instructive. Others who contributed papers were Dr. George Nathanson, Sydney, who dealt with protein therapy; Dr. J. L. Churchill, Halifax, who discussed nephritis; Dr. A. R. Campbell, Yarmouth, whose subject was gall-bladder surgery; and Dr. Philip Weatherbe, Halifax, who considered Legg's disease and reported a case. Dr. V. O. Mader, of Halifax, demonstrated a case of ankylosis of the knee joint. Dr. A. Birt, of Halifax, and Dr. Charles E. Simon, of Baltimore, (and Chester, N.S.) who were on the programme for papers, were prevented by illness from attending, but Dr. Simon sent a paper on the diagnosis of small-pox by the Paul method.

A large amount of important routine business was transacted, but time was found for the enjoyment of the splendid hospitality which had been arranged. Ladies who accompanied the members were motored to Mahone on the first day, and entertained at tea by Mrs. (Dr.) C. A. Hamilton, while in the evening they enjoyed a bridge at the home of Mrs. (Dr.) C. A. Donkin, Bridgewater. Many of the men also motored to Mahone to assist Mrs. W. N. Cochrane in the celebration of Dr. Cochrane's birthday, and after the evening session a most enjoyable smoker was tendered by the local committee. On the afternoon of the second day, a delightful sail on the beautiful LaHave River proved a fitting climax to the official entertainment. This was participated in by many of the good people of Bridgewater, who vied with one another in the endeavour to make the occasion one to be long remembered. Dr. Rehfuss delivered his presidential address, a scholarly and eloquent effort, while the excursion was in progress—a novel idea, which contributed much to the pleasure of the trip. Next year the Society will meet at Halifax, with Dr. E. V. Hogan as president. The other officers for the ensuing year are, Dr. J. J. Roy, Sydney, Vice-President; Dr. J. G. D. Campbell, Halifax, Secretary; Dr. S. L. Walker, Halifax, Associate Secretary.

The Dalhousie post-graduate course, which has become so popular with physicians of the Maritime Provinces and elsewhere, will begin this year on the first of September and continue until the eleventh. The sessions of the first two days will be held conjointly with the Maritime Section of the American College of Surgeons. Among those expected to participate in these conjoint meetings are Dr. Charles J. Mayo, of Rochester; Dr. G. W. Crile, of Chicago; Dr. Francis Campbell, of Brooklyn; and Dr. George D. Stewart, of New York. Dr. Stewart will remain over to assist the members of the Dalhousie faculty in their post-graduate programme, and it is hoped that Dr. Chipman and Dr. Meakins, of Montreal, and Dr. Luther MacKenzie, of New York, will also take part. An excellent programme has been arranged, with the practical needs of the general practitioner particularly in view, and a very successful course is anticipated. Last year's attendance was most gratifying, and doubtless this year's course will prove equally attractive. The course is given without charge, and is open to any qualified practitioner irrespective of his college or residence. Dr. H. K. MacDonald is the chairman and Dr. W. Alan Curry the secretary of the committee of arrangements.

QUEBEC

Marquette University, the largest Catholic institution of the kind in the United States has just conferred the honorary degree of Doctor of Science on Dr. M. T. MacEachern, Associate Director of the American College of Surgeons. The incident is of special

interest because it is the first time that a degree of this kind has been conferred for hospital administration. Dr. MacEachern is a Canadian and a graduate in medicine of McGill University. He was General Superintendent of the Vancouver General Hospital for ten years, a position

he resigned to become Director-General of the Victorian Order of Nurses and in charge of the reorganization survey. At present he is director of hospital activities and associate director of the American College of Surgeons with headquarters in Chicago. He is a past president of the American Hospital Association.

The details of the contract between the City of Montreal and the Montreal University whereby the city gives the latter the use of the Maisonneuve city hall to be used temporarily as a radium institute were given out recently. The building is to be used as a hospital for the radium treatment of patients. The indigent patients who will be sent there by the city shall be treated free. The building will be used as a hospital until the new Incurables' Institution at Cartierville is completed and ready for occupancy, when the Radium Institute will take up its quarters there.

Plans for the erection of a general hospital in Montreal under Jewish control and staffed chiefly by Jews were discussed at a meeting of the organizing committee of the proposed hospital, held in the Mount Royal Hotel, recently. The project was unanimously approved and it was agreed that it should be carried out in conjunction with the committee of the Hebrew Maternity Hospital. The new hospital will be for the use of all races and creeds and will have a maternity section. Doctors interested have promised \$20,000 towards its cost. The total cost of erection is expected to be about \$500,000 and the hospital will have 150 beds. Dr. N. Viner, President of the Montreal Clinical Society said that there was accommodation in Montreal hospitals at present for only one patient out of ten needing hospital care.

The Laurentian Sanatorium at Ste. Agathe will be opened shortly. At a meeting of the Board of Directors of the Laurentian Sanatorium Association, held recently at 47 Belmont Park, it was reported that more time was needed for repairs than had been anticipated, though the work was proceeding rapidly. Dr. J. R. Byers has agreed to act as consulting physician and medical advisor and was accordingly appointed as such. Dr. F. Larn-Phelps was named resident medical director. Miss Frances Upton has been appointed matron of the institution. She is a graduate of the Montreal General Hospital and has completed a post-graduate course of studies at McGill University.

A delegation of over thirty prominent citizens of Sherbrooke and the Eastern Townships waited on Hon. Jacob Nichol, Provincial Treasurer at his office recently to urge the Quebec Government to grant \$60,000 to the Sherbrooke Hospital to wipe out existing debts and set the institution on its feet. The delegation was headed by W. E. Paton, president of the hospital and included the hospital executive and Secretary F. N. McCrea, M.P.; A. J. Bissonnette, M.L.A., local doctors and clergymen and business men. The president explained that the sum required was \$40,000 to wipe out the debts on the buildings, \$15,000 for bills owing and \$5,000 for a bank overdraft. He spoke of the institution's thirty-seven years service and of the possibility of having to close it up if money was not forthcoming. James Mackinnon spoke in appreciation of the Government's past work and suggested that instead of the present Charities Act System, the Government should make yearly grants in proportion to the good work done. Mr. McCrea, M.P., Sheriff C. E. Therrien, J. H. Walsh, A. J. Bissonnette, M.L.A. for Stanstead, and Mayor J. B. Lebaron, of North Hatley, added a few words each in favour of the grant. Mr. Nichol said he had spoken to Premier

Taschereau and confidently hoped that at least part of the sum asked would be granted. He realized that Protestant institutions cost more than Catholic ones, because the former did not have the free services of nuns, but he reminded those present that the re-opening of the Ste. Agathe Sanatorium was a great aid to Eastern Townships Protestants. He agreed that the present act was not always workable because of the difficulty in securing the co-operation of the municipalities. While he thought he could secure part of the \$60,000 he was not sure of the yearly grant of \$5,000 also asked by the delegation since the present law allowed special grants only for building purposes, not for maintenance.

An informal luncheon was given by some members of the medical faculty of McGill University on Monday on Monday, June 15th, at the University Club of Montreal, to welcome Mr. Herbert W. Carson, the London Surgeon who was visiting Montreal on his way to take part in the annual meeting of the Canadian Medical Association at Regina. Among those present were, Dr. Alfred T. Bazin, Dr. A. D. Blackader, Dr. Kenneth Cameron, Dr. W. H. Hattie, Dr. C. K. P. Henry, Dr. C. B. Keenan, Dr. C. F. Martin, Dr. W. G. Reilly, Dr. F. A. C. Scrimger, V.C. and Dr. J. C. Simpson.

After luncheon Dr. Bazin introduced Mr. Carson in a few happy phrases, who in his reply thanked Dr. Martin, the Dean, and those present for giving him the opportunity of meeting so many of the prominent surgeons and physicians of Montreal, and asked his permission to carry out a very pleasant task which had been imposed upon him by the Council of the Royal Society of Medicine in London. The Royal Society of Medicine had asked him to make a small presentation to McGill University as a token of good fellowship. This took the form of an autograph letter from Sir St. Clair Thomson, the President of the Society and a mezzotint engraving of Dr. Edward Jenner, F.R.S. (one of the founders of the Medical and Chirurgical Society now fused with others to form the Royal Society of Medicine), by William Sharp after the painting by Hobday. This, he explained, was one of the Society's treasured possessions. Mr. Carson mentioned that Hobday (1771-1831) was a brilliant portrait painter who exhibited at the Royal Academy when only twenty-three years of age. He was very successful but he was improvident and had a chequered career. William Sharp (1749-1824) was the leading engraver of his day and will perhaps be best remembered for his portrait of John Hunter, Jenner's life-long friend. The original plate is in the possession of the Royal Society of Medicine and only a very few copies have been struck off. The portrait hangs in the building.

Dr. Martin accepted the presentation on behalf of the medical faculty of the university and expressed his sorrow that the short notice and the vacation had made a more formal reception impossible. He asked Mr. Carson to convey to the Council of the Royal Society of Medicine the thanks of the university for their delicate attention and courtesy and promised to send a more official acknowledgement to Sir St. Clair Thomson.

A contract for \$117,000.00 has just been awarded for considerable extension to the Lake Edward Sanatorium, Lake Edward, P.Q. The institution, which is exclusively devoted to the treatment of pulmonary tuberculosis, at present has sixty patients. With the new wing, seventy more patients will be accommodated. The sanatorium is situated about one hundred miles north of Quebec City, in the heart of the Laurentians. Dr. J. A. Couillard remains the medical superintendent.

GEORGE HALL

ONTARIO

On May 28th, at a meeting of the York County Medical Society held at Stouffville, Dr. G. W. Ross of Toronto gave an address on "Intravenous medication."

The Wellington and North Halton Medical Society met at Mount Forest on June 3rd, when Dr. W. P. Tew of London gave an address on an obstetrical subject.

At a meeting of the Lincoln County Medical Society held at St. Catharines on June 3rd, Dr. N. A. Powell of Toronto gave a talk on "The medical witness."

Dr. A. J. Grant of the Western Ontario Medical School, London, addressed the Medical Society of the Counties of Durham and Northumberland on June 3rd, his subject being "Neoplasms of the female breast; differential diagnosis and treatment."

At a meeting of the Victoria County Medical

Society held at Lindsay on June 5th, Dr. A. B. Lemesurier of Toronto spoke on "Fracture of the Femur."

The Hastings County Medical Society met at Tweed on June 10th; Dr. C. S. Wright of Toronto gave a talk on "Personal experiences in the investigations of chronic arthritis."

On June 18th, Dr. E. E. King of Toronto addressed a meeting of the Renfrew County Medical Society, his subject being, "The non-surgical treatment of enlarged prostate."

The Bruce County Medical Society met at Chesley on June 19th and the following addresses were given: "The modern conception of the use of drugs," by Dr. V. E. Henderson, Toronto; "The range of the general practitioner in psychiatric diagnosis," Dr. G. McLarty, Toronto.

At a meeting of the Sudbury Medical Society on June 19th, Dr. W. P. Tew of London gave an address on "The use and abuse of forceps."

ALBERTA

Dr. L. S. Rudin, formerly of Leduc, is now practising at Radway Centre, north-east of Edmonton.

Dr. A. W. Crawford, of Mannville, is now settled at Kitscoty having taken over the practice of Dr. Mackay who is now at Provost.

Dr. A. W. Girvin, who has for many years practised in Strathmore, recently moved to Calgary where he intends practising. Dr. T. W. Moore, of Rocky Mountain House, has taken over his practice.

Much interest has been centered in the recent trial of Dr. J. A. Hislop, of Edmonton, who has been held on a charge of manslaughter. The jury brought in a verdict of "not guilty" and he was honourably acquitted.

Dr. W. H. Hill, of Mountain Park has disposed of his practice to Dr. J. A. Urquhart, and is now practising at Luscar.

Dr. C. D. McBride, formerly of Waterhole, Alberta, is now with Dr. Buckley, at Michel, B.C.

G. E. LEARMONTH

BRITISH COLUMBIA

During the week ending July 4th, many doctors from all parts of the province were visitors to Vancouver in connection with the Vancouver Medical Association's Summer School and the annual meeting of the British Columbia Medical Association. There was an excellent attendance at all the meetings, which were voted an unqualified success.

The British Columbia Medical Association held a dinner on July 3rd, at which Sir Henry M. W. Gray, Surgeon-in-Chief of the Royal Victoria Hospital, Montreal, was the guest of honour. Sir Henry gave a delightful address which included interesting reminiscences of his work during the war. Other guests included Dr. Hugh Cabot, of the University of Michigan, and Dr. James G. Carr, of Chicago, Ill., who each gave a short talk in a particularly pleasing vein. Dr. Forrest Leeder, of Victoria, President-Elect of the Canadian Medical Association, proposed, in well chosen and facetious terms, a vote of thanks to the visiting speakers.

The Victoria Medical Society was well represented at the annual meeting of the British Columbia Medical Association, Drs. Forrest Leeder, W. Bapty, M. Raynor, and A. C. Sinclair, being present.

At the annual meeting of the British Columbia

Medical Association the following officers were elected for the ensuing year:—Dr. H. H. Murphy, Kamloops, President; Dr. W. B. Burnett, Vancouver, President-Elect; Dr. W. A. Clarke, New Westminster, Vice-President; Dr. J. H. MacDermot, Vancouver, Secretary-Treasurer.

The medical profession of British Columbia regrets to learn of the illness of the indefatigable general secretary of the Canadian Medical Association, Dr. T. C. Routley, and hopes he will make a speedy recovery.

Dr. D. J. and Mrs. Barclay, of Kaslo, B.C., had a miraculous escape from death when their automobile went over an embankment. The car turned over three times during its descent of one hundred feet, and when the occupants were extricated it was found that Dr. Barclay had a couple of fractured ribs and Mrs. Barclay some slight cuts about the face. It is hoped they will soon recover and be able to take the holiday on which they were just starting when the accident happened.

It is very gratifying to the Committee that the Summer School of the Vancouver Medical Association was this year a great success, following as it did right on the heels of the Canadian Medical Association meet-

ing in Regina, and the meeting of the Pacific Northwest Medical Association, in Portland, Oregon. The registration was up to normal and there was a full attendance at all the lectures. The Committee was very happy in its choice of lecturers, among whom were Dr. Hugh Cabot, Sir Henry Gray, Dr. James G. Carr, of Chicago, Dr. Roscoe Graham, Dr. Alan Brown and Dr. A. J. Pacini.

A number of medical men from Vancouver attended the meeting of the Pacific Northwest Medical Association in Portland, though, unfortunately Dr. A. S. Monro, the President, was unable to attend owing to illness. Dr. H. A. Spohn and Dr. R. E. Coleman read a paper on "Coeliac Disease" which will appear later in the *American Journal of Diseases of Children*.

Dr. H. Winslow Hill, our new Professor of Public Health and Bacteriology at the University of British Columbia, and Director of the Laboratories of the Vancouver General Hospital, has arrived in Vancouver and taken up his duties. He is enthusiastic over the beauties of Vancouver and is not regretting the change he has made. He was one of the first to register at the Summer School.

Dr. Llewellys Barker and Dr. A. Kanavel will be visitors in Vancouver at the end of this month and both these gentlemen have promised to give clinics and lectures to the Vancouver Medical Association while in the city.

We are glad to announce that Dr. Alison Cumming is somewhat improved after his illness of the past three months. He expects to take some time to completely recuperate, and is still confined to the house.

After spending four months in New York City and two months in Boston in the women's hospitals, Dr. Walter S. Turnbull has returned to Vancouver, where he has resumed practice which will be restricted to obstetrics and gynaecology.

Dr. Daniel McLellan is at present in the east, having left to visit his brother, who is ill in Ontario. While in the east he expects to visit New York and other cities, for post-graduate work.

Drs. J. A. Smith and J. C. Farish returned on June 6th from New York City, where they attended the New York and Manhattan Eye and Ear Hospital. They were much pleased with their "Round America" cruise via the Panama.

On June 10th, Dr. W. C. Walsh returned in fine fettle after having spent the previous three and a half months doing post-graduate work in New York City, Chicago and Rochester, Minn. Dr. Walsh reports having had an interesting and instructive course.

His many friends will be interested to hear of the birth of a son to Dr. and Mrs. D. J. Millar on May 30th, at Vancouver General Hospital.

On June 11th, thirty-one Seattle medical men came to Vancouver to play the return game in the Tri-City Golf Contest. The games were played on Shaughnessy

links in foursomes. The result in points was: Seattle, forty-eight; Vancouver, thirty-three. In the evening the usual dinner was given, in which about seventy participated, and everybody appeared to have had a most enjoyable day.

We also have to congratulate Dr. G. A. Upham on the birth of a son on May 29th, at the Vancouver General Hospital.

Dr. James G. Carr, Professor of Medicine at Northwestern University, Chicago, addressed the Victoria Medical Society on "Auricular Fibrillation" at a meeting held in the Empress Hotel on July 6th. The subject was forcefully dealt with and many heart problems were clarified.

The members of the Victoria Medical Society were the guests of Dr. Walter Bapty, the President, at his home, when Sir Henry M. W. Gray, of Montreal, met and addressed them. These occasional social meetings are much enjoyed by the members, and Dr. Bapty is warmly thanked for his kindness and the happy thought which makes them possible.

Sir Henry's visit with the Victoria profession was much enjoyed and we shall be pleased to have him with us again.

Dr. Pacini, of Chicago, addressed the Victoria Medical Society on July 4th, in the Library Rooms, his subject being "Physio-Therapy." Those present were much interested in Dr. Pacini's presentation and the conservatism with which this specialist revealed the wonders in this new field of treatment.

Dr. John A. Stewart, eye, ear, nose and throat specialist of Victoria, has returned from his visit to eastern centres and is looking exceptionally fit.

Dr. Russel B. Robertson has returned from a big fishing trip with some big fishing stories and a remarkably fine tan.

The Victoria profession is already looking forward to the 1926 meeting of the Canadian Medical Association, which is coming to Victoria, B.C. in that year. The election of Dr. Forrest Leeder to the Presidency for that session is most popular with the members of the Victoria Medical Society, and he may be assured of the whole-hearted and enthusiastic support of the local membership in the work which lies ahead.

Dr. F. R. Pollock has closed his offices in Victoria, B.C. and will confine his future endeavour to the practice of radiology as a specialty. He leaves Victoria with the good wishes of his associates, during his stay here.

VICTORIA MEDICAL SOCIETY

Sir Henry M. W. Gray, Senior Surgeon to the Royal Victoria Hospital, Montreal, was the guest of the Canadian Club, Victoria, B.C., at a luncheon tendered him at the Empress Hotel, on July 6th. Sir Henry made a splendid contribution to the cause of medicine in his address on "Progress in 20th Century Surgery."

UNITED STATES

AMERICAN BOARD OF OTOLARYNGOLOGY

An examination was held by the American Board of Otolaryngology on May 26th, 1925 at the Medico-Chirurgical Hospital, Philadelphia, with the following result:—Passed, 137; Failed, 20; Total Examined, 147.

The next examination will be held at the University of Illinois School of Medicine on October 19, 1925. Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Book Reviews

A Descriptive Atlas of Radiography of the Bones and Joints. A. P. Bertwistle, M.B., Ch.B., Leeds. 198 pages, illustrated. Published by John Wright & Sons, Bristol. Canadian agents, The Macmillan Co. of Canada, Toronto, 1924.

This, as its title implies, is an atlas in which excellent radiographs of all the important bones and joints are presented in such a manner as to provide an easy reference book for anyone who wishes to refer to such material.

Other atlases have appeared in the past and the only important departure in the present volume consists in the use of the "Silhouette Radiograph" by which means the skin line is distinctly seen. This advantage is more helpful in a book of reproductions than elsewhere, and adds considerably to the clearness and value of the pictures.

In the first two sections of the book normal structures are fully dealt with, including bones, joints, and the epiphyses. Part III is a review of all the commoner fractures with radiographs of each showing the usual deformity or displacement. Part IV. is an atlas of diseases of bone and provides typical plates of a large number of such conditions. In this way one may refer, in a doubtful case, to an established case for help in arriving at a differentiation. Part V. is devoted to injuries and diseases of joints, and Part VI. to a miscellaneous group of interesting or rare conditions not included elsewhere.

The plates are excellent and the choice of radiographs includes such a wide range as to provide a most helpful volume. At the present time when x-rays are so widely in use this volume should find a very wide field of usefulness, apart from radiologists who will welcome it especially.

G. E. RICHARDS

The Essentials of Healthful Living. William S. Sadler, M.D., F.A.C.S. Formerly Professor at the Post-Graduate School of Chicago. 481 pages, Price \$3.85. The MacMillan Company, New York and Toronto, 1925.

It has been a pleasurable task for the reviewer to peruse this well written book which is "dedicated to the memory of Pasteur, a pioneer in disease prevention."

The subjects chiefly dealt with are preventive medicine, general and personal hygiene. The author first reviews many of the important facts pertaining to sanitary science of ancient Jewish, of Grecian, and of Roman times, which are briefly referred to. Our modern conception of preventive medicine began with the discovery of the microscope, when with the knowledge of the germ theory of disease, a complete revolution in sanitary methods took place. This paved the way "for those magnificent achievements in disease prevention which so increasingly characterized the sanitary efforts of the nineteenth century, particularly its closing decades."

In the pages which ensue there is much food for thought and reflection, from which in the main the public may obtain a good understanding of our modern conception of disease prevention and of the care of the body. Of the several chapters in this work which are deserving of commendation, those on "The causes and prevention of colds," "The prevention of tuberculosis," "The prevention of digestive disorders," "The prevention of nutritional disorders," "The prevention of cancer" are all well written, thoroughly up to date, and full of common sense advice.

Certain subjects, such as those on "Headaches" and "Backaches" will prove rather bewildering to

the reader, since no less than fifty-eight or more leading causes are given as contributory to the production of headaches, surely sufficient to make an additional factor. However, sound advice is given that "in the case of persistent pains in the back x-ray pictures should always be made to make sure that tuberculosis is not present."

In the chapter on "The tobacco habit" Dr. Sadler has pictured a rather serious outlook for the habitual users of this seductive weed, which he classes among the narcotic drugs, and claims that it stands foremost among the common causes of high blood pressure and is a factor in the production of arterial degeneration. Dr. Sadler's views are not altogether in accord with the results of the researches of Baumberger, Lee and Mendelhall on tobacco smoking. Apart from these few criticisms, this book contains a fund of valuable information, the language is well chosen, and adapted, as far as possible, for the intelligent understanding of the layman, and can be recommended as a sound work for him to read.

GEORGE E. LEARMONTH

The Health Care of the Baby. Louis Fischer, M.D. Fifteenth edition, revised. 248 pages, with charts and illustrations. Price \$1.00 net. Funk & Wagnalls Co., New York and London, 1925.

A handbook "primarily intended for trained nurses and mothers has been so modified that it will be found helpful to the physician interested in infants as well as the medical student." It will enable physicians to answer correctly the many simple yet very important questions on baby care detail. In the hands of the trained nurse it cannot but be even more helpful. For the mother there is a multitude of safe counsel in it, the chapters on feeding so liable to be misinterpreted and become the agency of evil, the author has well nigh succeeded in avoiding, as far as seems possible.

That pertussis vaccine is useless after the whoop has developed, and that many cases of St. Vitus' dance have been cured by circumcision are statements contained in this book with which all will not agree.

This little work is on the whole a very commendable one.

J. S. BROWN

An Introduction to the Mind in Health and Disease. For students and general practitioners interested in mental work. By T. Waddelow Smith, F.R.C.S. (Eng.). p. 224. London: Ballière, Tindall & Cox, 1925.

The author, in his preface, states among other things that for the sake of clearness many hypothetical assumptions have been stated as facts and that in the general arrangement of the work he has closely followed Jelliffe, White and Higier—and these statements are borne out in the text. To one familiar with these authors it is difficult to understand how a condensed summary of their elaborate works—and they are by no means elementary in their style—can be presented to students and general practitioners, unfamiliar with these subjects as an introduction to the study of the mind in health and disease.

We fear that in trying to cover so vast a field in so small a volume, the author not only fails frequently to make his subject clear, but errs in giving no reference to schools of thought other than those of his authors. No reference is made to Janet, Jung or Adler as opponents of the Freudian school; Bleuler and Morton Prince are ignored; and he does not even seem to be aware of the existence of the conflict between the behavioristic and the instinctive schools.

The book is divided into two parts. The first part

(96 pp.) deals with the anatomy, physiology and psychology of the nervous system. From the literary standpoint there are many defects: misprints, errors in grammar, and looseness of composition; more particularly in the anatomical section there is much evidence of lack of first hand knowledge of the subject, especially of recent investigations in that field.

On the other hand in this section, when dealing with the endocrine glands, though he takes a great deal for granted, he gives a much clearer conception of their functions and interrelations than the critic has heretofore seen.

In the second part of the book, where he is dealing with abnormalities of mental function, he is obviously on much surer ground so that even his literary style is somewhat improved. On the other hand this part, in view of the leaders he has chosen to follow, suffers much from unproved assumptions and a too great inclination to one school of thought—the Freudian.

In short, while our author manifests no originality of matter of treatment, he tries to condense a large subject into a small book—making a matter difficult of comprehension still more difficult—for students or general practitioners. In the opinion of the critic the best service of the book would be as a summary or review to crystallize the wider reading of men already familiar with the subjects under consideration in this volume.

N. VINER

Rejuvenation. The work of Steinach, Voronoff and others by Norman Haire, Ch.M., M.B. 8vo, 223 pages. Price \$3.00. New York and Toronto. The MacMillan Company. 1925.

This book is written for the layman as well as for the physician. Eleven pages of bibliography are given for the medical reader who wishes to pursue the subject further. Some thirty pages cover the basic experiments on animals as recorded by Steinach, Voronoff, Thorek and Sand; one hundred and forty pages are devoted to operations on the human being, under the headings, vasoligature, testicular transplantation, transplantation and stimulation of ovaries. In his conclusions, the authors believe that vasoligature and vasectomy have no ill effects, the operations are not universally successful, but appear to have a place where there is no organic disease and senility has not proceeded too far. Transplantation of a testicle sometimes succeeds when vasoligature and vasectomy fail. Transplantation of an ovary has no ill effects and should always be carried out when a woman's own ovaries are to be removed, and is useful in cases of senility whether premature or normal. There is as yet no evidence to show that these operations prolong life.

J. H. E.

The Statics of the Female Pelvic Viscera. Vol. II. R. H. Paramore, M.D., London, F.R.C.S., Eng. Pp. xx + 424; illus. 58, including 35 plates. 24s. net. H. K. Lewis & Co., 28 Gower Place, London, W.C.1.

The author has made a masterly survey of the whole subject of prolapse, from 1742-1899. In his history of the subject he quotes observations of earlier gynecologists and their conception of "the problem"—suspensory operations excluded. Considerable space is devoted to the evolution of the pessary, describing types used at various times in all countries.

This book brings before the reader the pioneers of gynecology, and methodically the writer traces the operations for prolapse step by step from the 18th century onward, illustrating the method in vogue at different periods.

One is amazed at the tremendous number of original articles, books, papers and manuscripts analyzed by the author in compiling this volume. In addition

to merely quoting from various works, the author gives obvious reasons why the operation in question was a modification of a previous operative procedure, or gently criticizes a writer for not having more thoroughly reviewed the literature before laying claim to an operation previously described.

A careful study of the book is most edifying; the pitfalls of operators at various times are explained and the theories of writers on the support of the female pelvic viscera clearly presented. The author himself advances comparatively few new theories on this subject.

While the book is not primarily one for undergraduate students or general practitioners, yet the manner in which the book is presented is a stimulus toward the solution of the unsolved problem.

A book with such an extensive bibliography, is a most attractive volume for a teacher of the subject, giving him at a glance the ground covered from 1742 to 1899 by gynecologists in dealing with prolapse.

The author is to be congratulated on this Herculean task.

A. D. CAMPBELL

Clinical Therapeutics. By Alfred Martinet, M.D., Paris, France. Translation from the French edition by Louis T. DeM. Sajour, B.S., M.D. Cloth; two volumes, pp. 1800, with 332 illustrations. Price \$16.00. Philadelphia: F. A. Davis Company. 1925.

This would appear to be a most valuable work on the subject considered, the various phases of which are treated comprehensively, and in an attractive manner. The author is evidently of the opinion that the art of surgery is but a branch of therapeutics, and so considers it in discussing the various conditions in which surgery might be the treatment of choice. The clear descriptions and precise directions given in the cases of certain minor or semi-surgical procedures, such as intravenous administration of drugs, paracentesis, blood-transfusion, etc., add to the practical value of the book.

The translator has succeeded in rendering the original into very readable English, something that is not always true of translations. While it is not the duty of the translator to edit and revise, this is sometimes scarcely avoidable. In the work under consideration several sections, especially those on diabetes, required revision; otherwise the book would have been out of date before publication. The interpolations in the chapter on climatology are not always improvements: e.g., among dry, cold climates of low altitude are listed Minnesota and Canada. Information of this character is not of great value.

One feature of the work that might give ground for criticism is the multiplicity of drugs and formulas recommended in the treatment of various conditions. Not only are many drugs mentioned, but so many are combined in one formula, and such a number of the latter detailed that one is liable to become confused and fail to see the wood on account of the trees. The author is very fond of prescribing in the form of pills. This is a practice unlikely to become common here, where nearly all pills are prescribed ready-made, and where pill-making in the case of the average dispenser has become more or less a lost art. The method of using oxygen subcutaneously will, I imagine, be new to most Canadian practitioners. Many times in the course of this work the author indicates his faith in camphor in oil, especially where urgency exists. On this side of the Atlantic the preparation seems to have lost much of its former reputation as a stimulant. The giving of heart and kidney substance to patients with diseases of these respective organs seems at present to be pushing the theory of organotherapy rather far into practice.

The remarks upon psychotherapy in Vol. 1 and those upon psychoneurosis in Vol. 2 are most timely; and the conclusions expressed are evidently the result

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of the use of sound common sense. The description of graduated passive exercises for cases of failed cardiac compensation seems well worth while. The diet and food tables given in Vol. 1 cannot fail to be useful to the man in general practice. In the chapter on the treatment of gastric disorders the author expresses his views in a very clear and convincing manner. The chapter on the treatment of eye affections is well written; the therapeutic measures recommended are conservative and well within the scope of those for whom the book is intended.

The book is well printed on a dull-finished paper and bound with a flexible back, all of which make for the reduction of physical fatigue on the part of the reader. Finally, the translator must be congratulated upon his success in rendering a work of 1,800 pages into excellent English without having once had recourse to that much over-worked word, "evaluate."

HAROLD W. MCGILL.

Modern Marriage. Paul Popenoe. 259 pages. Price \$3.00. The Macmillan Co. of Canada, Toronto, 1925.

This is a sensible book which can safely be recommended to the young man, for it is written more from his standpoint than from that of the woman. It should do much to banish many of the vain theories which are undoubtedly held by the laity. The chapters are entitled "Why Marry?" "Whom?" "How?" "The Educational Period," "Love in Marriage," "Children." These are followed by an appendix on "Health and Marriage."

As is expected of the publishers this is an excellent example of good book-making.

ARCHIBALD MALLOCH

Stay Young. Raymond Leslie Goldman. 217 pages. Price 2.25. The Macmillan Co. of Canada, Toronto, 1925.

The author finds that mankind everywhere wishes to learn how to be healthy, how to be wealthy, and how to be happy. The reader of this book with its rather amusing illustrations will not at once have the answers to these three questions but there is a deal of sane advice in it. Apparently the American nation is on the whole too stout and this book tells how the prize-fighter reduces his weight and how the ordinary human being can adopt some of his methods. The remarks of the writer on sleeplessness and worry bear careful reading and the chapter, "Mastering your nerves," is, perhaps, the best in the book. Incidentally the author tells us how he overcame, or made the best of, his own physical disabilities.

ARCHIBALD MALLOCH

Infections of the Hand. Allen B. Kanavel, M.D. Fifth edition revised. 500 pages, illustrated with 196 engravings. Price \$5.50. Messrs. Lea & Febiger, Philadelphia and New York, 1925.

The fifth edition of this valuable work differs only slightly from the fourth and earlier editions. A chapter on "Excerpts from the Literature," of historical rather than practical value has been omitted. Its place has been taken by an important chapter on "Sequelæ of Infections of the Hand." Special consideration is given to ankylosis, contractures and loss of tissue, preventative measures and treatment. The value of the "Position of Function" is emphasized. Several new illustrations have been added, notably some describing the newer splints. The various subjects are discussed in a masterly manner and the book is probably one of the best yet published on a subject all too frequently casually treated. It is felt, however, that the same material in a slightly more condensed form would be of more ready assistance to the busy general practitioner.

L. H. MCKIM

Official History of the Canadian Forces in the Great War, 1914-1918. The Medical Services. By Sir Andrew Macphail, Kt., O.B.E., B.A., M.D., C.M., LL.D., M.R.C.S., L.R.C.P., F.R.C.S. Professor of the History of Medicine, McGill University. pp. vii + 402. Published by authority of the Minister of National Defence under direction of the General Staff. From all booksellers, or from the King's Printer, Ottawa, \$2.00, postage extra.

This book is the first of an official series intended to be a comprehensive history of the part played by the Canadian Forces in the Great War. All the volumes of the series will be based upon official documents, as this one is, supplemented by the testimony of officers who took part in the operations. Maps and plans, both bound with the text and issued separately, will permit of study more or less profound according to the tastes or purposes of the reader.

As was to be expected the writer has produced a history of striking literary quality, not a mere category of events, or statistical record, but what in the jargon of the day may be called a "human document." While it will be found to be of surpassing interest to those who bore a hand in the stirring events and tense situations discussed, it will be most readable also to all students of the Great War in its detached and philosophic setting forth of the methods followed when a loyal and earnest but inexperienced community like Canada set about bearing her share in defence of the gravely threatened Empire of which she knew herself to be a part.

The mistakes and negligences and ignorances of her effort are dealt with impartially and with restraint and good temper. The high courage, and the readiness for self-denial and suffering displayed by the whole community, both at home and at the front, are likewise recognized throughout both by open statement and reticent implication. The life of the men at the seat of war, both in the lighter moments of leave or rest or training, and in the mud and dust, and strain of long continued fighting, are shown in glimpses by deft selections from diaries made on the spot, and the temper and point of view of the Canadian Army are made plain as they were in those memorable months and years.

The chapters on Establishments at the Base and on the Lines of Communication, and on the Dental and Nursing and other ancillary services, are an adequate and deeply appreciative part of the history. The list of Honours and Rewards, and the Roll of Honour, (the names of our dead) are full and accurate. A chapter is devoted to the priceless help of the Red Cross Society of Canada in its operations both at home and in Britain, and on the various fronts.

The purely professional side of the Medical Services History is dealt with in Chapter XXI, and is as extensive as considerations of space permitted. Great amplification was wisely thought unnecessary, in view doubtless of the exhaustive discussion of this phase of the question in the Official History of the War—Medical Services—eleven volumes, edited by Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. and published by H.M.'s Stationery Office.

There is an illuminating Table of Contents, and the Index is excellently prepared.

J. T. FOTHERINGHAM

Treatment of Fractures. Reports of the Committee on Fractures, of the American Surgical Association for 1913 to 1918 and 1921. Edited by J. F. Binnie, M.D. and John H. Jopson, M.D. and others. Published by the Association, 1922.

This book is the outcome of a resolution adopted in 1912 at the Montreal meeting of the American Surgical Association, with a view to investigating the relative value of the operative and non-operative treatment of fractures. Information was sought on such

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points as the value of mobilization, the duration of absence from work, the degree of permanent disability, the value of abduction in fractures of the upper end of the humerus, the value of fixed extension, or of nail extension in fractures of the shaft of the femur, and the advantages and disadvantages of direct fixation of the fragments in open fractures, infected and non-infected. It soon became necessary to consider the character of the treatment available as that given by the average general practitioner, by trained surgeons in small hospitals and by skilled surgical experts.

In every case prolonged immobilization with continuous fixation must be abandoned. In the case of skilled experts, it makes little difference in morbidity or mortality whether the non-operative or operative plan is selected. It is considered that the time must soon come when metropolitan hospitals will not be considered satisfactorily organized unless fractures are assigned for treatment to specially equipped wards under the care of surgeons particularly interested in the pathology and treatment of these injuries. Two important conclusions are reached: (a) the necessity of immediate efficient reduction under general anaesthesia; (b) increase of the usual time of convalescence for consolidation in fractures of the weight-bearing bones of the lower limit.

Analysis of results showed conclusively that the surest way to secure a good functional result is to obtain anatomical reposition of the fracture. On the other hand even bad anatomical results under non-operative treatment give good functional results in very nearly as large a proportion of cases as is secured when only moderate anatomical results follow operative treatment.

The treatment of any fracture should not be considered complete until full restitution of function has been secured. More thorough records of the cases including a careful follow-up system should be kept.

The volume is a valuable record as far as it goes. It lays emphasis on the necessity for specialization in the treatment of fractures, a plea which the experience of the war amply supported. If all fractures were efficiently treated by experts from the beginning, a large proportion of the work of the orthopaedic surgeon would become unnecessary.

A. GIBSON

Disease and Deformities of the Foot. By John Joseph Nutt, B.L., M.D., F.A.C.S. Second edition revised. 309 pages, 105 illustrations. Price \$4.00 E. B. Treat & Co., New York, 1925.

In the preface the author states that this handbook was prepared for the use of the general practitioner, and as such it will be found useful and instructive. He has in one small volume condensed much information and instruction concerning the large majority of conditions affecting the foot. Most of the subjects considered are, however, treated with too great brevity to be of service to those with any considerable number of patients suffering from foot disability.

The most valuable chapters are, perhaps, those on anatomy and physiology. These subjects are discussed in a lucid and practical manner, providing a knowledge which will be of much value to physicians in the diagnosis and treatment of foot conditions.

The sections on weak foot, flat foot and club foot are reasonably complete, and provide all that is necessary for the physician treating an occasional case. It is unlikely, however, that general practitioners will be much interested in the detailed description of the author's "traction shoe." It would appear that orthopaedic surgeons are still interested in "harness making."

The foot conditions related to infantile paralysis are dealt with in a practical manner and the usual treatment described. The conditions due to infections are too inadequately considered to be of much value in either diagnosis or treatment. It would have added to its

value if the operative treatment of certain conditions had been more thoroughly considered. F. P. PATTERSON

"Tumours and Cancers." A Biological Study. By Hastings Gilford, F.R.C.S. With an introduction by Sir Frederick Keeble, C.B.E., Sc.D., F.R.S. Price £2. 2. 0. net. Large octavo, 703 pages. London, Selwyn & Blount, Ltd., 21 York Buildings, Adelphi, W.C.2.

In his preface the author remarks that "The search for the origin and nature of cancer has always been fluctuant. In the last few months there has been emphasis on the necessity of considering cancer as a biological problem." With this thought as his central basic idea he has assembled practically every known fact concerning the origin, development and natural history of tumours and cancers both in plant and animal life. Having marshalled his data he proceeds to certain conclusions as to the cause of cancer, and in this, the work is disappointing, since we really know nothing more than we did previously. "Decadent tissues, embryonic forms of cells, degraded proliferation, etc." are already well worn terms which really bring us no nearer to the actual exciting cause of cancer.

Were it not for the enormous amount of material comprised in this volume it would be without practical value, and as no attempt is made to adapt this material towards a solution of the surgical problems involved in the treatment of cancer the work cannot be said to be of particular interest to the working surgeon.

E. R. SECORD

Manual of Anatomy including Embryology. Fifth edition. Edited by E. Barclay-Smith, M.D., J. E. Fraser, F.R.C.S., F. G. Parsons, F.R.C.S., and W. Wright, F.R.C.S. 1702 pages, 810 illustrations. Price \$11.00. Baillière, Tindall and Cox, London. The Macmillan Co. of Canada, Toronto, 1925.

With this edition the editorship of Buchanan's Anatomy passes from Glasgow to London, and from one man to four. Since the editorship of Gray's Anatomy was transferred to Newcastle and that of Morris's Anatomy to the United States, the London school of anatomy has been without a representative text-book. Although, as indicated in the title, technically this work is not a text-book but a manual, virtually it is a text-book, differing from the conventional anatomical text-book mainly in the arrangement of the descriptions of the soft parts, in which the order of a dissecting manual is followed. This is its outstanding feature. Being edited by four London anatomists from as many medical schools, it may be regarded as the present-day representative London book on anatomy. The Bâle nomenclature is therefore conspicuous by its absence, even the list of B.N.A. terms which graced the concluding pages of former editions having been removed, as have the directions for dissection, it being the intention of the editors to publish the latter separately.

The book is excellent as books on anatomy go. It does not profess to be a work of reference, but even as a student's manual it resembles its fellows in that it contains too many of the facts of anatomy and too little of the science. This is inevitable in a book which conforms to those traditions of anatomical teaching out of which slowly but surely something higher is being evolved.

I. M. THOMPSON

Trial of Thomas Neill Cream. Edited by W. Teignmouth Shore. 8vo, xi + 207 pages. Illustrated. Notable British Trials Series. Price \$3.50. Canada Law Book Company Limited. Toronto, 1923.

Apart from its value as a study in psychiatry and in criminology, this volume has an added interest to the Canadian in that the criminal was a graduate in medicine of a Canadian University and was first in practice in Ontario. It would appear that his criminal practice

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began with arson immediately after graduation. The Dean's address to the graduating class was "The Evils of Malpractice in the Medical Profession," yet Cream was concerned, within a short time, with a case of abortion. Leaving after this for England, he failed in his primary for the M.R.C.S., but in the following year received his double qualification at Edinburgh and then came to London, Canada, to practice. Within a short time one of his patients died from chloroform, "administered by some person unknown," apparently a case of murder. Suspicion against Cream with a story of attempted blackmail upon a prominent merchant, ruined his practice and he soon left the city. It is noted that in his undergraduate course he gained some distinction for an essay upon chloroform. Two years later, he was arrested in Chicago on the charge of murder arising out of an illegal operation, but escaped conviction. The same year and the following year two deaths were ascribed to him, one due to strychnine. He fled to Canada but was arrested and on trial in Chicago was found guilty of murder and received a life sentence. Though his guilt was so clear, enough unbalanced (so-called sympathetic) people were found to present a petition of weight to the governor to have the life sentence of this psychopath commuted and he was released. In the fall of 1891, this sinister man arrived in London, England, where victim after victim, all from the street walker class, were foully murdered, his operations finally bringing him to the scaffold. The story of his crimes is well told and the full report of the trial and evidence is given. During his London residence he even attempted blackmail upon one of England's greatest consulting physicians. We are given the story of a man, well qualified in medicine, who immediately after graduation became a professional abortionist, a filthy blackmailer, and a wholesale murderer. He was not insane from the legal point of view for he clearly understood his acts were illegal. Yet the alienist and psychologist could scarcely consider him sane. He was a drug fiend and this may have been a factor in his career of habitual

murder. His lustful habits and the debasement of moral fibre through drugs led him to the point of losing all sense of moral obligation. He became a sensualist, a sadist, drug sodden and remorseless, a degenerate of filthy desires and practices, who used his medical knowledge to slay his unfortunate victims. What suffering would have been avoided had not soft hearted, misguided enthusiasts sought his release from Joliet prison!

J. H. E.

Diet in Health and Disease. Julius Friedenwald, M.D., and John Ruhrah, M.D. Sixth edition, thoroughly revised. 987 pages. Price \$8.00 net. W. B. Saunders Co., Philadelphia and London. Canadian Agents, J. F. Hartz Co., Toronto and Montreal, 1925.

The sixth edition of such a large volume indicates the steady interest of the profession in matters concerning diet, and the demand for encyclopaedic information. Only such an encyclopaedic book could afford to print thirty pages on the analysis of proprietary and other diabetic foods. This is the extreme to which are carried the numerous tables that confuse as well as aid the general practitioner.

The amount of space devoted to the muscular activities of the gastro-intestinal tract belittles the importance of this function of the tract. A good working conception of the muscular activities and their correlations is necessary for the application of dietetics to any particular case.

The text shows the balanced judgment which goes with experience, and has been expanded in keeping with the accumulation of knowledge and scientific investigation.

The size of the book makes it difficult for the practitioner to readily grasp the main principles, but the arrangement of the matter is such that he can readily find information on any special point.

W. GOLDIE

The Question of Leukocytosis Following Typhoid Perforation of the Intestines.—

There is no uniformity in medical literature concerning leukocytosis following typhoid perforation of the intestines. A review of the subject reveals a wide diversity of opinion. Finding these various opinions, Edward M. Livingston and Willard H. Squires, New York, determined to ascertain the leukocytic reactions produced by typhoid peritonitis. Among 2,215 cases, intestinal perforation was diagnosed in seventy-four instances (3.52 per cent.). Operations were performed on sixty-six of the patients, and necropsy records corroborated the diagnosis in three additional cases. Intestinal perforation was established, therefore, in 3.11 per cent. of the series. The operative recovery was 28.12 per cent. An analysis was made of all white blood counts taken in fifty-five cases of proved intestinal perforation. Eight showed leukocytes; eight, a slight rise; twenty-nine remained constant, while in ten there was a definite fall. In other words,

52 per cent. remained constant; 15 per cent. showed leukocytes; 15 per cent. a slight rise and 18 per cent. a fall in the count, following intestinal perforation. An analysis of these findings lead the authors to the conclusion that leukocytosis is not merely inconstant but unusual after perforation of an ulcer. The conclusion of this review, likewise, does not correspond with the opinion that the differential blood count is a most important diagnostic consideration at the time of perforation. It was found that a decrease in the number of polymorphonuclear leukocytes with a relative increase in the lymphocytes followed this accident more frequently than the reverse of this reaction, yet the changes were as inconstant and inconclusive as the results with reference to the total white blood counts. In cases presenting clinical evidence of typhoid perforation of the intestines, any delays in operating to observe further the leukocytic changes are not justified. —*Jour. A. M. A.*, April 4, 1925.